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T-BOOK
OF
URSING

By

ARA S. WEEKS

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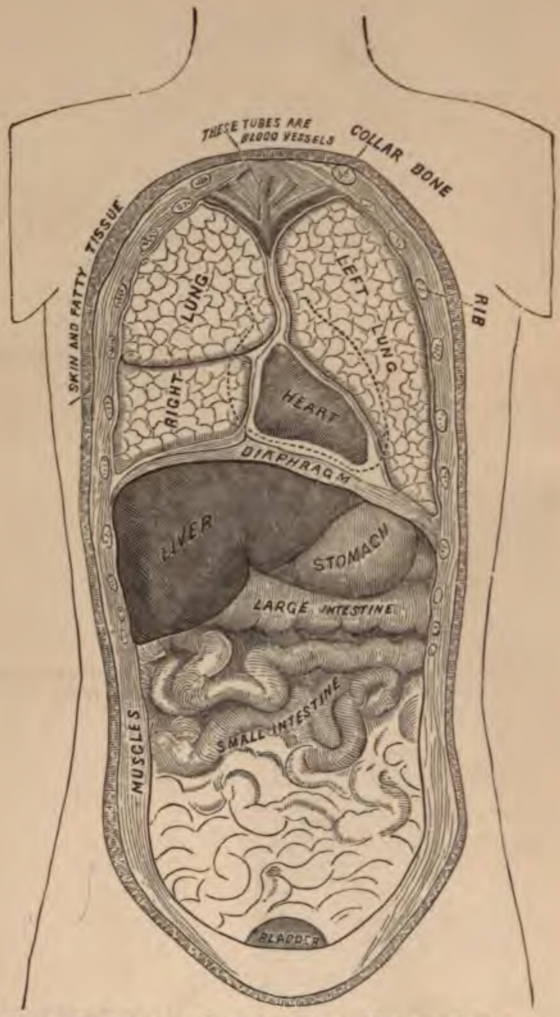

FRONT VIEW OF THE ORGANS IN THEIR NATURAL RELATIONS.
The heart is partly covered by the lungs, but its true outline is indicated by a dotted line. Only ten ribs are shown on each side, the eleventh and twelfth (the floating ribs) being too short to be included in the section.

A
TEXT-BOOK OF NURSING.

FOR THE USE OF TRAINING SCHOOLS, FAMILIES,
AND PRIVATE STUDENTS.

COMPILED BY

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TRAINING SCHOOL FOR NURSES, PATERSON, NEW JERSEY.

NEW YORK:
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1885.

DEDICATED TO
ZILPHA E. WHITAKER,
IN MEMORY OF MUTUAL EFFORTS.

34238

PREFACE.

THE need of a more comprehensive Text-book than has yet been published seems to be generally felt in our Nursing Schools. The one now offered, with the exception of a few practical points, the result of personal observation, makes no claim to be regarded as anything more than a compilation, all authorities bearing upon the subject having been freely used. It is by no means intended to serve as a medical compendium, but it is hoped that it will save others the necessity, which has been so frequent in my own experience, of going through a mass of extraneous and over-technical matter in search of the little things which they need to know.

I desire to express my grateful acknowledgments to Professor E. L. Youmans, for his kind encouragement and assistance, and to Dr. J. S. Hawley, to whose valuable criticisms and careful revision of the manuscript the book will largely owe any value that it may possess.

C. S. W.

NEW YORK, *June, 1885.*

INTRODUCTORY.

THE recent efforts to improve and elevate the art of nursing, as shown by the multiplication of training-schools for its study and practice, are recognized by all as constituting one of the most truly beneficent monuments of the age. In alliance with medical institutions, and supervised by the medical faculty to the end of the highest efficiency, these schools raise a vocation formerly regarded as vulgar, because followed by the ignorant, to the rank of a profession, thus opening a new field of activity to women, alike congenial, honorable, and remunerative. And, while the circumstances of a large number of women are thus essentially improved, the community reaps the priceless benefits of better care and mitigated suffering in sickness, more effectiveness in medical ministration, and the prolonging of human life. The immediate and positive good thus attained by the training-schools for nursing must lead to their extension in the future, and should commend them to the favor of all who can in any way aid in the promotion of their salutary objects.

I have sometimes thought that indirect benefits, also of much importance, are to be expected from this movement beyond its strictly technical objects. It gives to young women an education which, whether they follow the profession or not, will be of great and permanent value to them in the common experiences of domestic life. No possible social changes in the future can relieve woman of those cares and responsibilities which spring from the maternal function and involve the welfare of the family ; and it is too late to maintain that knowledge and training are not indispensable to the best performance of feminine home duties. But neither in the Ladies' Seminary, the High School, nor the Female College, is this invaluable education to be had. The training-schools for nurses give the best preparation of woman now available for her especial work and rule in the home sphere. By combining theory with practice, by uniting the cultivation of the head and the hand, the intellect, the feelings, and the active powers in a common discipline, they conform to the most advanced requirements of education. There are strong reasons, therefore, why young women of ability should in the future more and more avail themselves of the advantages of these schools.

The efficiency of schools is always much dependent upon the adaptation of text-books to the method of study adopted. The literature of the subject of nursing is, in many respects, excellent, but its comparative newness has left much to be desired in the way of improvement of the manuals of study. The text-book now offered has been prepared not merely to give information and lay down rules, but to guide systematic training on a practical subject, and to facilitate thoroughness of school-work. The volume has grown out of a familiar consciousness of the needs and difficulties of nursing, together with the experience of the working teacher, and the practical character it has thus acquired, its excellent method, and the clearness and directness of its style, show that in preparing it the author has done an admirable service to her profession.

E. L. YOUMANS.

June, 1885.

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A

TEXT-BOOK OF NURSING.

CHAPTER I.

Necessity for the instruction of nurses—The nurse's work—Qualifications of a nurse—The duties of a nurse—to herself—to the doctor—to the patient.

THERE are few, especially among women, who will not at some time in their lives be called upon to officiate in the capacity of nurses; fewer still who will not at some time have occasion to be grateful for the ministrations of a skillful and efficient nurse, or annoyed by the blunders of an awkward and incompetent one; and yet it is only within a comparatively short time that the importance of special and thorough training for such work has become generally appreciated. There has been no opportunity for the acquirement of such education, however much individuals may have desired and felt the need of it.

Until within a few years, the nursing in our hospitals was committed to the hands of women of the lowest, often of the criminal, classes, chosen without regard to character or capacity. It was held a degrading occupation, which no self-respecting person would voluntarily adopt; and "Sairy Gamp" was recognized, not as the amusing creation of a novelist, but as the common type and representative of the nursing class.

It seems strange that this state of affairs should have so long been allowed to exist, for such coadjutors must have effected quite as much hindrance as help, and what useful purpose they could have served in hospitals, except as scrub-women, is incomprehensible to the trained nurse of to-day, who realizes the responsibility which her position involves, and the daily exercise of gentleness, firmness, and, above all, tact, which the successful management of a single ward necessitates. But a prejudice against the instruction of nurses was entertained at the outset by some of the medical profession, who feared that educated nurses would trench upon their own province, and, if they were taught to know one drug from another, would immediately proceed to the practice of therapeutics on their own account.

This feeling is fast dying out, as they come to see that in just this particular is the essential point of difference between the trained and the untrained nurse. It is only those who have had no formal instruction as to their duty, its extent and its limits, who are guilty of thus overstepping the bounds of propriety; not those who are taught, but those who are untaught, and who have picked up, in a hap-hazard way, certain isolated facts regarding medical treatment, which they generalize and act upon. The trouble with such nurses is not that they know too much, but that they know too little. It is impossible that, with sickness and its treatment always under their eyes, they should not assimilate some information; the only question is whether they shall be taught it systematically, and in its proper relations, or whether they shall be left to appropriate and use it empirically. The question has been sufficiently answered by the success of the training-schools, and the ever-increasing demand for nurses trained to a knowledge befitting their position. The existence of the schools has been amply justified; it remains for each individual nurse to prove the thoroughness of her training, by showing how completely and exclusively she can mind her own business.

Says the great English physiologist, "If knowledge is real and genuine, I do not believe it is other than a very valuable possession, however infinitesimal its quantity be. Indeed, if a little knowledge be dangerous, where is the man who has enough to be out of danger!" Learn, then, all that you can—only take care that your knowledge *is real* and *genuine*, and not a mere smattering of technical terms—and you may be assured that the more you know, and the more thoroughly you know it, the more will you realize the depth of your own ignorance, and the less will you dare to make any other than the legitimate use of your knowledge.

Health has been comprehensively defined as the "perfect circulation of pure blood in a sound organism." Any departure from either of these three conditions constitutes disease. There is recognized in nature a certain tendency to reparation, a predisposition to return to the conditions of health, whenever there has been any deviation from them. To assist this is the object of treatment. To keep the patient in the state most favorable for the action of this reparative tendency, is especially the vocation of the nurse, and it is beyond a doubt that those who best understand this, and have the fullest acquaintance with nature's processes, will be the most successful nurses.

The importance of the art of nursing can scarcely be overestimated; in many cases the recovery of the patient will depend more upon the care he receives than upon medical skill. Nursing properly includes, as well as the execution of the physician's orders, the administration of food and medicine, and the more personal care of the patient, attention to the condition of the sick-room, its warmth, cleanliness, and ventilation, the careful observation and reporting of symptoms, and the prevention of contagion. It is a work which falls largely, though not exclusively, to the share of women, and it has sometimes been claimed that all women make good nurses simply by virtue of their womanhood. But this is far from true. To fitly fill such a position requires certain physical and mental attributes, which all women—even all good women—do not possess, as well as some special training. A natural aptitude for nursing is a valuable basis for instruction, but will not take the place of it, nor will good intentions ever compensate for a lack of executive ability.

Unimpaired health and power of endurance, intelligence, and common-sense, are primary essentials for a nurse. She should be a person of even, cheerful temperament, not easily irritated or confused—for to lose temper or presence of mind in the sick-room is fatal to usefulness. She must have acute perceptions, habits of correct observation and accurate statement, and some manual dexterity. She needs to be quiet, neat, and systematic, and capable of eternal vigilance.

There is still too prevalent the impression that it is a waste of ability for an educated woman to become a nurse; that it is a fit resource rather for those worn out, discouraged, or incapable of anything else. Those who have tried it know that, on the contrary, there is in this work room for the exercise of talents of the highest, and virtues of the rarest order, and surely in this day, when there are so many women in need of occupation—

women of some degree of culture and refinement, who look in vain for some suitable outlet for their energies—it ought not to be true, as it is, that the majority of the applications for admission into our training-schools are from those utterly unfit for the work; either surviving relics of the by-gone times when a nurse ranked on or below the par of house-maid, or sentimentalists with their heads full of romantic visions of themselves flitting about like angels of mercy, bathing the brows of suffering heroes, and distributing among them flowers and smiles. The latter class are sure to be disappointed, generally disgusted, for they find the reality practical, prosaic, and often even revolting. But it is a field of usefulness such as is nowhere else afforded, and a woman with the requisite qualifications, who desires to be really of service to her fellow-creatures, and to adopt an employment of absorbing interest, at once honorable and remunerative, can not do better than to train herself for a nurse. It is to such as have entered upon this course with an earnest aim to well qualify themselves, and to elevate the professional standard, that the following instructions are addressed.

When you have once undertaken the care of a sick person, his welfare is of course understood to become your first consideration. With this object always in view, your duties may be classified as threefold: those which you owe to yourself, those due to the physician under whose direction you work, and such as relate immediately to the patient. Something is perhaps owing also to the school with which you are or have been connected. You are at least afforded an additional motive for guarded conduct by the remembrance that you are its representative to the public, the exponent of its methods, and that, according as you behave yourself well or ill, credit or discredit is reflected upon the entire school. It may at first glance seem somewhat strange to assert that your own personal duties should take precedence, but a little reflection will show that whatever theories of self-devotion you may entertain, and however willing you may be to sacrifice your own comfort to the welfare of your patient, disregard of the duties to yourself will sooner or later incapacitate you for the fulfilment of all others. You may give up your convenience, your pleasure—indeed will be perpetually called upon to do so as the inevitable claim of the work you have chosen—but your health you have no right to risk. Remember that self-sacrifice is not always unselfishness, and that the nurse who takes the best care of her own health will be best able to care for her patient. Ill-regulated zeal only defeats its own object ; if you wish to be really and permanently efficient, you will take pains not to lower the standard of your own physical condition. Even a nurse is but human ; you can not retain your vigor and consequent usefulness without a due allowance of rest, food, and exercise. It is your duty, as well as your right, to insist upon securing these, and to take proper time for the care of your own person, and for your meals. You owe it to yourself also, and to the whole nursing sisterhood, to enforce a suitable regard for your reputation, and for the dignity of your position. The maintenance of strict propriety and decorum on your own part will rarely fail to command respect.

To the doctor, the first duty is that of obedience—absolute fidelity to his orders, even if the necessity of the prescribed measures is not apparent to you. You have no responsibility beyond that of faithfully carrying out the directions received. It is true that nearly all orders are conditional, and that circumstances may occasionally arise which would render literal adherence to the plan of treatment indicated, useless or even injurious, whence the necessity for an intelligent understanding of the case on the part of the nurse. But only the most positive and evident reasons justify any departure from her instructions. In a hospital, where a medical attendant is always within call, there will never be any occasion to assume such responsibility. Here military discipline should prevail, and implicit, unquestioning obedience be the first law for the nurse, as for the soldier. In private practice there is more room for the exercise of judgment, but a good nurse is very careful to do not always what seems to her best, but what it seems to her that the doctor will best approve. Whatever may be your own private opinion of the course pursued, you will, by conscientiously carrying out your instructions, give it every chance of success, and never permit yourself to express an unfavorable criticism upon it. Loyalty to the doctor includes encouragement of the patient's faith in him, so long as he is in charge of the case. The imagination is so largely active in disease that to infuse doubt and distrust into the patient's mind is often to destroy all hope of doing him good. The nurse is a connecting link between doctor and patient, responsible to the one, and for the other, and can do much to promote good feeling between them. Between doctor and nurse there should be the most perfect *entente cordiale;* let him find you always ready to second his efforts with an enthusiasm equal to his own. You owe to him, finally, the utmost candor and truthfulness. Nothing should induce you to pervert or conceal from him anything bearing upon the case, and, if you should chance to be so unfortunate as to make a mistake in carrying out his orders, be honest enough to promptly acknowledge, and by that means do what you can to rectify it.

To your patient you owe attention to whatever can affect his health or his comfort. You must be ever on the alert to minister to and even to anticipate his many personal wants. These will vary so much in different cases that few directions can be laid down beyond the general ones for constant watchfulness and thoughtfulness. No two patients are alike, and it is by no means the greatest sufferers who give the most trouble, or make the heaviest demands upon a nurse.

There is one necessity common to all cases, that of cleanliness. Keep him with a clean skin, clean clothes, clean air, and clean surroundings generally, and much will be done toward satisfying your patient's needs. This, of course, includes the strictest attention to your own person, which should be an example of cleanliness. A neat and attractive appearance goes far toward making a nurse acceptable. Your dress should be fresh and tidy, of quiet colors, and with immaculate caps and aprons, if such are worn. The hands especially should be well cared for, kept smooth and warm, with the nails short, and well brushed. Cold or heavy hands will make a patient shrink from your touch; long, sharp nails are likely to scratch him. Cultivate a touch at once firm and gentle, light and steady.

The prejudice against cleanliness and fresh air, which even in this enlightened age will frequently be encountered, must be combated firmly, though always kindly. It is often a matter of no small difficulty to persuade a patient to submit to having his room suitably ventilated, and almost equally prevalent among the ignorant, and still more unaccountable, is the dread of clean clothes.

Such notions must not, for the patient's own sake, be altogether yielded to, neither should they be allowed to give rise to endless dissensions. Cultivate the patient's confidence in your judgment, while making him feel that you are really his friend, ready and willing to consult his preferences on all minor matters, and he will be less likely to suspect you of arbitrary decisions upon others. Never use force where persuasion will avail, even with a delirious patient, and do not make an unnecessary display of authority.

The authority must, however, exist, and will occasionally have to be exercised. You will often be obliged to insist upon things very much against the inclinations of your patient, and to administer remedies when he only desires to be "let alone," and no sentiments of mistaken tenderness should deter you from the performance of duty, even when it is mutually disagreeable. It is from failure in this direction, as well as from defective knowledge, that amateur nursing is often faulty. Hired nursing is now usually the best, and the very worst that which comes from the family and friends of the patient. A calm, steady discipline is needed in the sick-room ; that patient, cool control which is far more likely to be exerted by a stranger than by a relative ; the very intensity of interest felt for a dear friend often tending to incapacitate for judicious ministrations. You will not allow the longing to comfort and soothe the sufferer to blind you to his real interest, yet be on guard against growing hard and unsympathetic in this rigid adherence to duty. Undoubtedly much familiarity with suffering does to some extent blunt the sensibilities, but the relation between nurse and patient is one of so much dependence on the one side, and so much helpfulness on the other, as to tend to develop what may be described as the maternity of nursing. A sick person is, for the time being, as a child, and looks to his nurse for a mother's care. From such a relation a certain tenderness of feeling almost inevitably springs, and with it patience to bear with the whims and irritability of the sick.

And a nurse soon learns to make allowance for the close connection between mental and physical states. Invalids are often utterly unreasonable. It is as much a part of some diseases as the physical symptoms, and perhaps as little under control. You will scarcely mind what a sick person says to you, so long as you are sure that he has no real ground for dissatisfaction. But bear in mind that diseased fancies can not be dissipated by argument; there must be either absolute proof that they are unfounded, or an effort to do away with the cause of complaint. At least, do not set a thing down as unreasonable, and so do nothing about it, without thorough investigation. The senses of the sick are often abnormally acute, and a source of discomfort, as a bad odor or an unpleasant draught may make itself painfully evident to them, while it is quite imperceptible to any-one else.

As a rule, whatever tends to keep the invalid quiescent and contented is good for him; all occasions of excitement bad. A tranquil, peaceful, though cheery atmosphere should prevail. As far as possible, let everything appear to the patient to be moving smoothly and easily, no matter what difficulties and annoyances you may encounter. Try to secure for the sufferer repose of mind as well as of body, freedom from anxiety, and absence of all discussions. If he sees that nothing is overlooked or forgotten, he will soon learn to have faith in you, and will gladly leave you to do his thinking for him. Do not call upon him for decisions, even of small matters, but decide for him. When there is doubt in your own mind as to the best plan to be pursued, consult, not the patient, but the doctor. Frankly acknowledge your ignorance to the person from whom you can get the desired information. There are very few medical men who will not be willing to explain to you what they can, if they are asked at the right time and in the right way.

Try to find out why things are done, to be familiar with underlying principles as well as details of practice. Learn to nurse by reason rather than by rule, for no rule can be laid down to which exceptions will not arise. Do not fancy that after you have been through a training-school you will know all there is to know about nursing ; in fact, you will only have been taught how to learn, how to appreciate and profit by the experience which you will get. Every new case will teach you something new.

Apropos of asking advice, the complaint has been made of trained nurses that they have too high an opinion of their own qualifications, and are unwilling to accept suggestions. On the other hand, a lady not long ago remarked of one whom she had employed, "I don't think she knew any more than the rest of us, for all her hospital training, for she followed everybody's advice." It is obviously impossible to suit everybody. A certain amount of adaptability is as desirable as self-reliance, and there may be many little personal matters about which other people must know better than yourself the tastes and habits of your patient. With regard to such things, you will of course be glad to receive suggestions and assistance. You will almost always find somebody willing to help in the care of the sick. You will be fortunate if they do not rather hinder. Often the greatest trial of a nurse is the well-meant interference of the patient's friends. If there are any among them to whom you can leave your patient, you must bear in mind that many details, matters of course to you, are likely to be unfamiliar to the inexperienced, and leave with your relief the clearest and most explicit directions about everything that is to be done. If in writing, there will be so much less room for mistakes. If you have no such relief, and find that your strength is being overtaxed, state the case to the doctor, and ask for help. If, for any reason, you find it necessary to give up a case the care of which you have once assumed, you must at least not leave it until you have seen your place adequately supplied. To leave, unadvisedly, a patient in a critical condition should be regarded as a breach of contract; no conscientious nurse would feel justified in doing it. With a chronic case, of probable long duration, you are under no obligation to stay on indefinitely, but when you wish to go, you will, of course, give notice of the fact in time for other arrangements to be made. Under no circumstances ought you to threaten the patient with leaving him.

In speaking of the relations between nurse and patient, it should not be necessary to more than refer to the fact that a nurse occupies a position of trust, and is perforce admitted to a knowledge of many private affairs. No one with any sense of delicacy can regard as otherwise than inviolably sacred what is thus tacitly left to her honor. It is true that your patients will be largely dependent upon you for society, and that it is often difficult to produce conversation on demand, but it is certainly possible to be bright, cheerful, and entertaining without resorting to gossip.

In a hospital, the intimate intercourse of the home nurse with her patient is impracticable and undesirable. Over-familiarity is to be avoided, and strict impartiality preserved, but at the same time the greatest patience and gentleness may be exhibited, and all possible regard for the comfort of the patients.

CHAPTER II.

The model sick-room—Its choice, contents, and arrangement—The care of the sick-room—Noise, etc.—Hospital routine—The care of a hospital ward—Cleanliness—Order—Economy.

The comfort and well-being of the invalid depend to so great an extent upon his surroundings that, in consideration of the universal liability to illness and accidents, there ought to be in every well-arranged house an apartment chosen and especially fitted for the use of the sick. But the matter, in spite of its importance, is so generally ignored that it is very rarely that a nurse will have the good fortune to find any provision made for such contingency. You will be called upon to nurse in all sorts of places, and often under the worst possible sanitary conditions. It is important to have a clear idea of what a sick-room ought to be, in order to know how to choose the least among unavoidable evils, and how best to utilize such advantages as you may chance to secure.

A model sick-room is spacious, light, airy, clean, and quiet. The larger the room, the better can it be aired; the more airy it is, the cleaner will it be; and, the cleaner it is, the more favorable is it for the recovery of the patient. Space is therefore an important consideration from a hygienic point of view. The sick-room should be located on the sunny side of the house, having a south or west aspect. Only in exceptional cases, such as inflammation of the eye or brain, is it necessary to have the room darkened, and even then a south room, with the light carefully moderated by blinds and curtains, is to be preferred to a darker one on the north side. Light is a healthful stimulus, and in the majority of cases not only light but direct sunshine is to be desired, partly for the additional cheerfulness which it imparts, but still more because of its actual physical effects. The Italians have a proverb, "Where the sun does not enter, the doctor does," showing their recognition of it as a powerful remedial agent. Have as many windows as possible, certainly no less than two. They should be such as can be opened at both top and bottom, and should reach nearly to the floor, that the patient may easily see out of them. Bars and streaks of light are to be guarded against, as they may occasion a great deal of annoyance.

The sick-room should be as far as possible remote from the noises and odors of the house and of the street. It should be solidly built, having walls thick enough to deaden external sounds, and floors substantial enough not to vibrate under every tread. Where this is not the case, manage, if possible, to have the room above unoccupied. There are numerous advantages to be gained, especially in cities, by having the sick-room at the top of the house. It will be more quiet, in a stratum of purer air, and in case of contagious disease can be more completely isolated. On no account should there be stationary basins in the sick-room itself. If you find there such modern conveniences, cork up the overflow holes, or stop them with plaster of Paris, and fill the basin with water, which must be changed from time to time, or cover it entirely and closely with a board. The increased security will more than compensate for the extra trouble. Only with the utmost precautions against leaky and defective traps are drainage pipes to be allowed even in the adjoining dressing-room.

The latter is an important adjunct to the sick-room. In it are to be kept the bath and toilet appurtenances. Ample closet room is also desirable, with shelves and drawers for the reception of linen, and of the various medical and surgical appliances which may be needed, but which should never be visible in the sick-room. It is a common, but very reprehensible, practice to have food, medicine, and all sorts of paraphernalia lying about, in a confusion that would be enough to make a well person sick. They should all be banished, except at the moment of actual use. Growing plants, and freshly cut flowers of not too strong odor, may fill their place, if desired. They are quite unobjectionable. The water in which flowers are kept must be daily changed, and the flowers themselves thrown away as soon as they begin to fade. Do everything possible to make the sick-room the brightest and cheeriest in the house. A certain amount of depression is the inevitable accompaniment of sickness. It can not be entirely dispelled, but all counteracting influences should be brought to bear. Dark, gloomy, and unpleasantly suggestive surroundings do much to intensify it.

The walls and ceilings are best of some soft, uniform, neutral tint, as pale-green or French-gray. Avoid wall-papers of conspicuous tone or regularly recurrent figures. Better than any paper is paint, or a hard-finished surface which can be scrubbed. The monotony may be broken by pictures, but judgment needs to be exercised in their selection. The wood-work should be severely plain and flat. There should be no cornices or moldings, and no woolen curtains, *portières*, or drapery of any kind. All woolen stuffs easily become infected, and are extremely difficult to disinfect. If any curtains are used, they should be of light, washable and frequently-washed material. Carpets even are much better dispensed with. Rugs may be used, as footsteps are noisy on a bare floor, but they must be small enough to be daily removed, shaken and aired. If there is a carpet, it can only be thoroughly swept and cleaned when the patient can be got out of the room, but the surface dust can be removed quite effectively and noiselessly by means of a damp cloth wrapped around a broom.

The essential furnishings of the sick-room are, a bed, a bedside table, an easy chair, a lounge, and a large movable screen. The latter can be readily improvised by fastening a shawl or a sheet over an ordinary clothes-horse. Convenient tables are made with the point of support very much on one side, so as to reach well over the bed. They may be raised or lowered to any desired height. Bed-trays, with a low rim around three sides may be used by the patient for all the purposes of a table. They are about thirty inches long, by fourteen broad, and stand on legs high enough to keep the weight entirely off the body.

A bed-rest, a commode, and similar small conveniences may be desirable, but the fewer superfluous things the better. All the furniture should be of the simplest possible style ; elaborate carvings only afford lodging-places for dust, and whatever adds to the difficulty of maintaining absolute cleanliness is to be avoided. Everything should be substantial and in good repair. Ill-fitting blinds, rattling windows, and creaking doors, are nuisances demanding speedy remedy.

Many slight and apparently unimportant noises, which are nevertheless peculiarly annoying to the sensitive nerves of the sick, may easily, with a little care and forethought, be done away with. Keep rocking-chairs out of the room. Avoid wearing clothes that rustle, or shoes that squeak. If coal must be put on the fire, bring it in wrapped in a paper, and lay it on, paper and all. Use a wooden rather than a metallic poker to rake the fire. Noise which is understood and inevitable is far less trying than a much slighter noise, unexplained or unnecessary. Intermittent is more hurtful than continuous noise. Sudden, sharp, and jarring sounds are especially bad. A good nurse never startles her patient. Even in such a small matter as your way of addressing him, be considerate of his weakness. Do not speak abruptly from behind him, making him first jump, then turn round, then ask what you said, but get his attention before speaking, and use a clear, distinct, though not necessarily loud, voice. Whispering in the sick-room, or just outside the door, is one of the worst of the many distressing forms in which the solicitude of the patient's friends will manifest itself. There are few things more tormenting, though it is usually done with the very best intentions of not disturbing him. A low, distinct tone, when conversation is necessary, will seldom annoy. Whispering always will, as will any sound which strains the attention, or creates a sense of expectation. It should be laid down as a rule that whatever the patient is not intended to hear should not be said in his presence.

These seem very small points to dilate upon, but good nursing depends largely upon attention to details so apparently trivial that a careless person would never think of them, but which yet make or mar the comfort of the invalid. Small things assume momentous proportions in the limited interests of a sick-room. Nothing is insignificant or beneath notice which has any bearing upon the welfare of the patient. To keep the sick-room in a proper condition is as important a part of your care for him as more personal ministrations. A nurse ought not to be expected to do housework, which can be equally well done by some one else, for she has enough other and more fitting demands upon her time and strength, but, in order to direct others, she should know how it ought to be done. The work of a nurse in a private family varies so much with circumstances that its limits can not be precisely defined. The position is a somewhat anomalous one, and, with all due regard for your professional dignity, surely you will rather perform the most disagreeable and commonplace tasks than let them go undone to the detriment of your patient. With the extra work which sickness always brings, there is often insufficient service, and the nurse will be obliged to share the burden. You must be prepared to encounter many inconveniences ; your ingenuity as well as your patience will often be taxed ; and sometimes you will find yourself looked upon as a kind of machine, expected to run night and day without ever needing to be wound up.

In a hospital there are no difficulties of this sort. Everything is planned with reference to the needs of the sick ; the most convenient appliances are at hand as a matter of course ; the duties of each person are definitely assigned, and the work as much as possible simplified by systematic arrangement and regular hours.

In a ward of twenty patients, with the average number of bad cases, there will be usually three nurses, with a maid or an orderly to do the scrubbing and heavier work. The head nurse has the oversight of them all, and, present or absent, is responsible for everything done or left undone. Some assistance may be given by the convalescent patients, though it is an uncertain dependence. Care must, of course, be taken not to overtax the strength of any one, but they can be made useful in a good many little ways, and are usually glad of some light occupation. Their work is, however, little to be relied upon, for a patient able to do much is likely to be soon discharged.

Ward work, in spite of its variety, may, if skillfully planned and systematized, be reduced very much to a routine. Minor arrangements vary in different institutions, but the fundamental principles of the nursing service are everywhere the same. The nurses appear in the ward, ready for duty, punctually at the appointed hour. The patients should previously have had their morning toilets made, under the direction of the night nurse, that there may be no delay in getting them ready for breakfast. The head nurse first reads the report of the night, and ascertains any changes that there may be in the condition of the patient, or in the orders given. Unless she has very competent assistants, she will then herself attend to the care of the worst cases among the bed-patients, and to the giving out of the medicines. There are also all the beds to be made, the temperatures to be taken, soiled clothes to be collected and sent to the laundry, the ward generally to be cleaned up, and the diet distributed. All these tasks are divided as the head nurse may direct. One assistant must take charge of the breakfast, see that each patient is served with his appropriate allowance, and those fed who are unable to feed themselves. Convalescents should not be allowed to begin until all the bed-patients are attended to. After the meal is over, the dishes are to be picked up and carried out, and the ward made ready for the doctor's visit. All this takes time, for sick persons can not be hurried. The nurses must all be ready to attend the staff upon their rounds. The head nurse must be informed as to the condition of every patient under her care, ready to answer any questions that may be asked. She must be provided with a note-book, in which to take down on the spot whatever orders are given, and she should call attention to everything which it is important for the doctor to know. If there are three nurses in the ward, the senior goes on in advance of the staff, and expedites their progress by preparing each case for ready examination. She will know from the nature of the case what is to be done; the clothing must be conveniently arranged without undue exposure; sometimes it will be necessary to put screens about the patient, or to remove the dressings from a wound. The junior nurse, or probationer, following them, restores things to their previous orderly condition, so that, when the rounds are completed, the ward will not be in a state of general confusion. Provision should be made for the doctors to wash their hands before they leave the ward. After they have gone, the head nurse will explain to her assistants the orders which she has received, assigning to each such part of the work as she wishes her to do. The rest of the morning will be occupied with the execution of these orders. The nurses take turns in going to their own meals, that the ward may never be left without a responsible attendant. The senior and junior nurses will together attend to the distribution of the patients' dinner; it is usually too much for either to manage alone. One must, however, always be held responsible for the state of the dining-room. She must see that it is in order before she leaves it, the dishes washed and put away, the refrigerator clean, sweet, and locked. The dumb-waiter should be kept closed when not in actual use, and no article except food, and dishes for food, ever be allowed on it.

After dinner the great press of work is likely to be over, and, after the ward is once more in order, the nurses may each in turn be allowed an hour's absence for recreation. This hour ought, more frequently than it is, to be spent in the open air. Later in the day will be evening temperatures to be taken, supper to be given out, and preparations to be made for the night.

Besides these enumerated, are numberless other things to be done daily. Old patients are going, and new ones continually coming in all stages of dirt and dilapidation.

When a patient is admitted, he is at once put to bed, unless by special permission to the contrary. If a stretcher-patient, his coming will have been previously announced, and a bed prepared to suit the nature of the case. A list of his clothes must be made, and carefully verified. Such as need it are to be sent to the wash, or to the disinfecting tank, others put away in the closet belonging to his bed. He must have a bath, if able, and, very possibly, also, be treated with some parasiticide. His temperature is to be taken, and any marked symptoms reported. In a susceptible person, the change of surroundings, and consequent excitement, may have a considerable effect upon the pulse, respiration, and even temperature; it is, therefore, advisable to take them not only immediately upon the entrance of the patient, but again a short time—say an hour—later. He will have light, usually fluid, diet only, until special directions are received.

In the same way every event brings its own demands for more or less time and attention. After twelve hours, the day nurses will be relieved by the night nurse. One at least of the former must stay on duty until the latter comes, even if the day's work should happen to be quite done earlier. Connections between them must be perfect, and the ward never be left without a nurse in it, or within call. The night nurse is subordinate to the head nurse of the ward, and takes the orders from her. The doctor, in making his evening rounds, will give additional directions. The duty of the night nurse is important, for all seriously sick people need great care at night. She must try to get the wards quiet and the lights down early, and to do her work with as little commotion as possible. Before she goes off in the morning, besides making a verbal report to the head nurse, she must prepare for the doctor a written record of everything noteworthy which has occurred during the night.

For work to go on smoothly, there needs to be the greatest harmony and accord among all the nurses. They have devoted themselves to a common object, with which no petty personal feeling should ever be allowed to interfere. No nurse is fit for her position who will sacrifice to any narrow jealousies or disputes the working order of her department.

All that has been said of the care of the sick-room applies with even stronger emphasis to the hospital-ward where a greater number of lives are at stake. The first requisite is scrupulous cleanliness. No amount of ventilation will keep the air sweet in a ward that is not clean. It has been sagely remarked, that "dust in a ward is not only dirt but danger." It consists largely of organic matter, which must be taken away, not merely stirred up and redistributed. Nothing really removes dust but a damp cloth or sponge, to which it will adhere. To sweep properly a room full of people requires more care than a maid will, without special oversight, be inclined to give. The ordinary flourish of brooms raises a cloud of dust, and drives it over the beds, and into the eyes and mouths of their unfortunate occupants, who can not get out of the way, but can only stay and be choked. On a hard floor, soft-hair brooms should be used with long strokes, and the dust frequently taken up. Water for washing floors should be often renewed, and not too freely used. Vigorous rubbing with a cloth or carriage sponge, wrung out nearly dry, will do more good than a deluge of dirty water. During the sweeping, the rugs should be taken out of doors and shaken. Some dust will of necessity escape into obscure nooks and corners, all of which should, therefore, be under strict supervision. Dusting, except of metallic surfaces, must be done with a damp cloth, followed, if need be, with a dry after-polish. The feather-duster in common use is worse than worthless, except to bring down to an accessible height dirt that is out of reach, for it serves only to scatter the dust and make it less conspicuous, a disadvantage rather than a desideratum.

All vessels must be removed from the ward immediately upon use, and thoroughly cleaned. A slop-pail should never be brought into the room; all waste matter, even water used for washing, should be at once carried out. Communicating passages, bath-rooms, and closets, as well as the ward itself, must be under strict supervision, for it is of little use to have an immaculate ward, if every time a door is opened it gives admittance to a gust of unclean air from some dusty or ill-ventilated lavatory. To keep the lavatories free from odor needs special care. Water-closets should be thoroughly flushed, and occasionally have some disinfectant poured down them. Any failure of water supply, or discovery of imperfect drainage, must be at once reported to the proper authorities. There should be not a hole or corner anywhere which will not bear the most rigorous inspection. All basins, bath-tubs, and metal fixtures, must be kept bright and shining.

Remove from the ward promptly all soiled clothes. Before sending them to the laundry see that no pins are left in them, that they are distinctly marked with the name or number of the ward, and, if private property, with the name of the patient. Roll very dirty things in a bundle by themselves. A list must be made out, of which a duplicate is retained, for comparison when the clothes are returned.

Cleanliness, everywhere "next to Godliness," takes precedence in a hospital ward of all other virtues: "Order, heaven's first law," has a secondary, but still an important place. A well-kept ward is characterized by neatness and uniformity. A little care to have things straight adds much to its attractiveness of appearance. The beds should be in an exact line, curtains at an equal height, chairs, tables, and rugs at the same angle to each other. Few things give a ward a more disorderly effect than clothes tucked about the beds or tables, or flung over chairs. The bedside tables must be daily inspected, and no rubbish allowed to accumulate in them. Unless carefully watched, patients are very apt to stow away, in the nearest place, dirty clothes, relics of meals, dead flowers, apple skins, or any refuse that may need to be disposed of. Refuse-cans should be provided, always of metal, with tightly-fitting covers. They should never under any circumstances be allowed to stand uncovered. They will need to be scoured out every few days with some strong disinfecting solution.

Nothing should be thrown out which can be in any way utilized. If supplies are liberally furnished, do not, therefore, think that little bits are of no account, but make them go as far as possible. Hospital supplies are of an expensive nature, and it is the nurse's duty to see that nothing is wasted. See also that supplies are well kept up. Everything expected to be on hand renewed before it is quite exhausted. In a surgical ward, the dressing-basket should stand in some accessible place, furnished with everything likely to be called for in an ordinary dressing.

To keep things in order, it is necessary to work neatly, and clear up after each performance before undertaking another. Much confusion will be avoided by getting everything ready, even to the smallest detail, before beginning any process. Have a clear idea in mind of what is to be done, and never get excited. You will then be able to be prompt without hurrying, quiet and methodical in movement, and will doubtless soon achieve a reputation as a neat and skillful nurse.

CHAPTER III.

Beds—Bedsteads—Bedding—Bed-making—How to move a patient from one bed to another—Pillows—Bed-rests and other appliances—Air- and water-beds—The care of a bed—Bed-sores—prevention—symptoms—treatment.

It is the common notion that anybody can make a bed, and possibly also that it is of very little account exactly how a bed is made. To a thoroughly healthy person, who will sleep soundly all night and turn out of bed as soon as he wakes, it does not indeed matter much, although he spends a third of his life in it, whether his bed be well or ill made, so long as it is clean and warm. But the invalid, whose confinement to it is more or less permanent and compulsory, and the acuteness of whose sensations is aggravated by disease, finds few things more seriously affecting his comfort than the condition of his bed. To know how best to arrange and take care of it, is very important for the nurse. When you go to take charge of a private patient, who has been till then cared for by home talent, in nine cases out of ten the first thing you will find it necessary to do will be to reconstruct the bed, and often the skillful rendering of this simple service will at once call forth the gratitude of your patient, and instant recognition of your efficiency.

Let us first consider the frame upon which the bed is supported. Wooden bedsteads should not be used for the sick when anything else can be obtained. The best kind is that common in our hospitals, entirely of metal, iron or brass, with a mattress of woven wire. This can be more easily than any other kept in a clean and wholesome condition, and is for sick-room uses far superior to those ordinarily found in private houses. They are non-absorbent, and afford no hiding-places for vermin, which, in spite of all precautions, will sometimes appear, even in well-cared-for homes, and to which public hospitals, with their miscellaneous class of patients, are especially liable. The first sign of a bug should be the signal for a most careful search and extermination, for, once having gained a foothold, they multiply, as every housekeeper knows, with alarming rapidity. Corrosive sublimate is the surest remedy, but, being a violent poison, must be handled with caution. Another exterminator, recommended for all kinds of vermin, consists of the following formula : Aqua ammonia, two ounces ; saltpetre, one ounce ; soap, scraped, one ounce ; and soft water, one quart.

Bedsteads should be on castors, to be easily moved, and no heavier than is necessary for strength. The best dimensions for a bed in which a sick person is to be cared for, are six and a half feet long, three feet wide, and two, or, at most, two and a half, feet high. If it is too wide, the nurse will be unable to reach the patient without getting on the bed herself, always an objectionable proceeding ; if it is too high, it adds to the difficulty of raising the patient, and makes it harder for convalescents to get in and out.

Over the wire springs will be placed a mattress of some kind. For this various materials are used—hair, straw, jute, compressed sponge, etc. Straw has the advantage of cheapness, and the ticks can be frequently emptied, washed, and refilled, while the old straw is burned; but hair of good quality makes the most comfortable bed, being at once firm and elastic. It can be cleaned and subjected to a disinfecting temperature without injury. Hospital mattresses are frequently made in sections, as they wear more evenly, and a part can be renewed without taking to pieces the whole. When this is done, it is well to have the sections tacked strongly together, as they are otherwise apt to slip apart, leaving an uncomfortable crack under the patient. Still, an expert bed-maker will get the under sheet tight enough to hold them in place.

A feather-bed is a thing never to be thought of in connection with the sick-room, being a combination of every objectionable quality. Its use is nearly equivalent to putting the patient into an immense poultice; it is warm, soft, absorbent, and consequently nearly always damp. Unless it is stuffed uncommonly full, the patient sinks at once into a hole; it is impossible to keep it level, and, if it once gets wet, there is no way of renovating it. Once in a while one comes across some old lady, who, by long usage, has become so attached to her feather-bed as to fancy that she can not sleep on anything else. If she is able to get out of it daily, to have it shaken up and rearranged, it is scarcely worth while to struggle against the prejudice; but, if she is likely to be confined to bed for any length of time, the first thing to be done is to get her off it, for, offering as it does every condition favorable to the development of bed-sores, it will be a source of danger as well as of discomfort. After a few days' trial, even the most persistent lover of the feather-bed will usually be convinced of the superiority in sickness of an unyielding support.

If not, and the sufferer still clings to her old habits, then we are sorry for the nurse, for she has a hard task before her. In many surgical cases it is of great importance that the bed be kept flat and level. Where extra firmness is required, a thick board, the size of the mattress, is placed under it. This is known as a fracture-board. It should have holes bored in it for ventilation.

The propensity of hospital patients to stow away their personal property under the mattresses should be provided against. Give them other safe and convenient places to put their things, and insist upon having the beds kept clear.

For sheets, cotton is a better material than linen, except, perhaps, in very hot weather. Linen being a good conductor of heat and rapid absorber of moisture, has a tendency to chill the surface of the body; cotton does not conduct away the heat so rapidly, and is, therefore, safer for the use of the sick. Sheeting comes in widths adapted for beds of different sizes. Whatever the width of the sheet, the length should exceed it by three quarters of a yard. There should not be a seam in the middle.

To make the bed, spread the lower sheet smoothly and tightly over the mattress, tucking it in securely on all sides. It can be made still more firm, if the bed is being prepared for long occupancy, by fastening with safety-pins to the mattress. Be careful that the sheet is put on straight, for, if not, it will draw into wrinkles, and, if pinned, be likely to tear. There should not be a blanket between the under sheet and the mattress. It may be necessary to protect these from discharges by a piece of rubber cloth, covered by a second folded sheet, or a narrower "draw-sheet." The latter, as its name implies, may be easily drawn from under the patient with very little disturbance to him, while another is at the same time slipped into its place. The water-proof and draw-sheet must both be stretched as tightly as possible, and well tucked in. When rubber sheeting can not be obtained, enameled cloth or oiled muslin will answer the purpose, or, in an emergency, heavy brown wrapping-paper is said to be a fairly good substitute. The rubber, being only for the protection of the bed, should not be retained longer than is really necessary, as the patient may be more comfortable without it.

The upper clothing should be enough for warmth, but no more; for too much warmth is enervating, and too much weight impedes respiration. There will be first another sheet, tucked in well at the foot, that it may not be pulled out of place, but left long enough to turn down for some little distance over the blankets. A woolly surface coming in contact with the face is usually very disagreeable, though, in some cases, where there is special need for warmth, as in acute rheumatism, the patient will be put directly between the blankets. Blankets of good quality are the best bed-covering, being warm, and not weighty. They should come up high enough to tuck in snugly around the throat, if desired; but the patient should not be allowed to sleep with his head under the bedclothes, breathing the noxious emanations from his body. Several thin coverings will be warmer than a single one of equal weight, because of the non-conducting air enclosed between them. Heavy quilts and counterpanes will be found burdensome. The old-fashioned cotton comforter is heavy, and not proportionately warm. Eider-down quilts, or duvets, are luxuriously light and soft, but can not be well cleaned or disinfected. A patient sleeping under one should be carefully watched, as it is likely to induce excessive perspiration. If one desires to avoid the weight of a counterpane, a clean white sheet will take away the unfinished look of the blankets alone, and at the same time protect them from dust. Counterpanes, being chiefly ornamental additions to the outfit of the bed, may as well be taken off at night, and so kept clean the longer. An extra blanket will be needed toward morning, and should always be at hand. Blankets, as well as sheets, need washing whenever they are stained or dingy, or taken from infected beds. Fresh blood-stains can be removed from blankets or ticking, by spreading over the spot a paste of fine starch or wheat flour, and leaving it to dry there. If, upon rubbing it off, the stain is found not to have entirely disappeared, a second application will be pretty sure to be effectual. Blood and other stains can be removed from rubber by Labarraque's solution (of chlorinated soda).

The beds in a hospital ward should be made to look as nearly alike as possible, the surfaces even, the spreads equally far from the floor on both sides, and with the corners arranged at the same angle. In some hospitals the convalescents make their own beds ; but a great lack of uniformity results, detracting much from the neat appearance of the ward.

The sick-bed should stand far enough from the wall to be accessible on all sides. It should be in such position that its occupant can see out of the window, but whatever artificial light is employed, is best behind him.

Nothing should be allowed under the bed, nor should there be any drapery to prevent free circulation of air below it. The bed should stand steadily, not to be easily jarred. Sitting on the bed, leaning against it, or in any way shaking it, occasions great discomfort to the patient. Sometimes, even the touch of the bedclothes can not be endured. They may then be supported over the seat of pain by "cradles," frames of iron or wood made for the purpose. The two halves of a barrel-hoop tied together in the middle will make a fairly good one ; or, for a limb, a bandbox, split through the center. Or the clothes may be lifted on a strong cord running diagonally from head to foot of the bed.

For changing a sheet or draw-sheet, while the patient is in bed, the method usually recommended is to *roll* the soiled sheet lengthwise, from the edge of the bed farthest from the patient, till it reaches him. The clean sheet, previously rolled in the same way, is then unrolled over the space from which the first was taken, until the two rolls lie side by side. The patient may then be lifted or turned over on to the clean sheet, the soiled one entirely taken away, and the rest of the clean one unrolled. It will be found an improvement upon this, instead of rolling the sheets, to fold them alternately backward and, forward in the manner illustrated, as the folds lie flatter than the roll, and, when the upper one is pulled, the others readily follow. This is more easily manageable, and less likely to become tangled than the more compact roll. If it is not advisable to move the patient, even from one side of the bed to the other, the mattress may be pressed down, while the clean and soiled

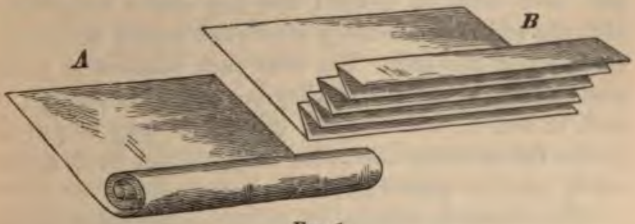


FIG. 1.

sheets are together gradually worked under his body. The head and feet can be slightly raised to allow the folds to pass. It takes two people to do this easily.

The upper sheet can be changed with even less trouble, and no exposure. Free the clothes at the foot of the bed. Spread the clean sheet outside of them all, over it a blanket, and tuck them in securely before removing the first set. Finally, slip these from under the clean sheet, and carry the blanket out to air. If the extra blanket is not at hand, the clean sheet may be rolled or folded across its width, tucked in at the bottom, and unrolled toward the top *under* everything else, the soiled sheet being afterward pulled down and removed at the foot. See that each blanket is made smooth and straight. If they are not wide enough to tuck in well at the side, the upper one may be put on across the others; otherwise they will all be dragged off on one side when the patient turns over.

The common custom of taking a crumpled upper sheet and putting it on in place of a soiled lower one is not good economy in sickness. If there can be only one clean sheet given, let it be the one on which the patient has to lie. His comfort, unless he has an unusual regard for appearances, depends more upon having a smooth, fresh surface under him than upon having it where it will show most. The sheets ought to be changed frequently—at least one every day, if only to be aired and used again. See that all clean articles likely to be needed are at hand before removing the soiled, and well aired and warmed. Dampness in bed or bedding is always dangerous. If the bed gets to feeling close and unpleasant, it may be to some extent aired by lifting the clothes at the edge of the bed, and fanning them up and down a few times. This may be done without danger of chilling the patient, and will—especially in warm weather—be found refreshing.

If you can not change the sheets, pull them as tight and straight as possible, which will give a fresh feeling to the bed. The best possible arrangement is to have two of the narrow beds above described, from one to the other of which the patient can be daily moved. Each is to be supplied with its own complement of bedding, one set being aired while the other is in use. Even a very sick person can be easily moved by two attendants, one standing at his head, and the other at his feet. The second bed must be put as closely as possible by the side of the first, then the sheet upon which the patient lies is lifted by the corners and carried steadily over. He must be let down slowly, gently, and without jar. Then slip from under him the sheet on which he has been moved. Be sure, before you begin, that this is a strong one, with no rent in it that may give way. Two poles or long brush-handles, rolled tightly into the sheet to within a few inches of the patient's body, will convert it into an impromptu stretcher, upon which he may be kept perfectly horizontal during the moving process.

If the two beds are of exactly equal height, you may be able to accomplish the transfer alone. One way to do it is to pin a stout rubber cloth to the bed from which you wish to move your patient, letting it lap over on to the other so as to cover the intervening crack and give a level surface, across which he may be drawn by means of the sheet on which he lies. Or, having the two beds side by side, pull the mattress with the patient on it a little way over the other. He may then be slid down on to the fresh bed, and the first taken away. This is easy if the mattress is not too thick and heavy.

If the patient is light, the easiest way of all may be to carry him, putting one arm under the knees, and with the other supporting the back just below the shoulders, but this is scarcely advisable except in case of a child.

All this is assuming that the sick person is perfectly helpless. If he can help himself a little, it of course makes the matter still less difficult. To move him into another bed, although it sounds like a good deal of an undertaking, is really little more trouble than to rearrange his own under him, while it makes him more comfortable, and gives an opportunity to thoroughly air each bed. There are a few surgical cases—thigh fracture, etc.—in which such change is impracticable, and in a private house one is not always able to command hospital conveniences. Where one wide bed must be used, some of the advantages of two may be obtained by using alternate sides of it. One half may be kept for the day-time and the other for the night.

Be especially generous with pillow-cases. Have clean ones often. Pillows need to be frequently changed, or shaken up and turned, as they soon get hot and uncomfortable. In doing this, lift the patient's head carefully, and let it rest on one arm, while with the other hand the desired arrangement is effected. Then lay him back gently ; do not let his head drop with a jerk.

To prop up a patient with pillows, first see that one is pushed well down against the small of his back, and then put each additional pillow behind the last. This will keep them from slipping, and support the back without interfering with the play of the lungs. A single long pillow, stuffed hard, thick at one end, and gradually diminishing toward the other, like a wedge, is better for this purpose than half a dozen of the ordinary kind. One or two softer ones may be put on top of it. Wooden bed-rests are made, and, for temporary use, a straight-backed chair, turned upside down, is very good. Bed-rests of netting, secured at each end to the bedstead, are said to be very cool and airy. They can be so arranged as to swing the patient quite off the bed. For a weak patient, with an inclination to slip down to the foot of the bed, Cullingsworth's roller-pillow is valuable. This is a cylindrical cushion, some four inches thick, with a strip of stout webbing at each end fastening it securely to the head of the bed. The patient, as it were, sits upon this, and is supported by it. There are an endless number of invalids' beds made to tip up at various angles, and several forms of patent apparatus for lifting and holding up the patient while the bed is arranged under him. A very simple and useful appliance for helping the invalid to help himself, is a strap with a handle, pendant from a hinged crane over the bed, or from a ring in the ceiling.

Small pillows, of various sizes and shapes, are frequently serviceable. Rubber air-cushions are especially comfortable. They should be smoothly covered, and the cover sewed, not pinned, on. In some cases an air- or water-bed will be called for. They are both made of rubber: the former is filled by bellows, the latter connected with a hose. The air-mattress may be put on an ordinary bedstead, but the water-bed lies in a wooden trough. An old blanket or cloths must be put under it to keep it from sticking. The water with which it is filled should be at a temperature of 70° Fahr., and should be renewed every two weeks. Cover with a blanket before putting on the usual bedding. Care must be taken to avoid pricking water or air cushions, or beds.

Crumbs in a bed constitute one of the minor miseries of sickness, and can not be too carefully looked out for.

There should be a regular crumb hunt after each meal. A well-cared-for bed is evidence of a good nurse. From neglect or ignorance of its proper management very serious consequences may arise in the form of bed-sores.

These result from continued pressure upon prominent parts of the body, and may vary from slight abrasions of the skin to deep wounds. They appear most frequently upon the lower part of the back, the hips, shoulders, elbows, or heels, but may develop wherever the conditions are favorable. There is liability to them in all cases of long confinement to the recumbent posture, especially where there is a much lowered vitality —as in paralysis, fevers, and old age. Very heavy and very emaciated patients are alike predisposed to them, and they are among the most trying complications of surgical cases, where motion is restricted. Bed-sores are frequently occasioned by bad nursing, and the cases are rare in which a good nurse can not avert their formation. They are more easily prevented, than cured when once established. Preventive measures consist in keeping the parts thoroughly clean, and the surface under them dry and smooth, in hardening the skin, and so far as possible relieving the local pressure. This precautionary treatment should be commenced at the beginning of any long sickness, without waiting for manifest signs of danger. The parts most subjected to pressure must be frequently washed with soap and water and thoroughly dried. A draw-sheet should be placed under the patient, which must be changed as often as it becomes damp from any cause, and the greatest pains must be taken to keep it free from wrinkles, crumbs, and inequalities of any kind. The patient's clothes must not be permitted to get into folds or creases under him. The skin may be hardened by bathing several times daily with alcohol, brandy, or eau-de-Cologne, or a solution of bichloride of mercury in alcohol, two grains to the ounce. Follow this by rubbing in well a small quantity of some simple ointment, to keep the skin supple. Finally, dust the parts with some fine powder, to absorb the moisture of the skin. Oxide of zinc is perhaps the best. Lycopodium powder is very fine and soft, but has the disadvantage of staining the bedding. It must be borne in mind also that it is highly inflammable, and must not be used in the vicinity of a lamp. Fine starch or the ordinary toilet powder used for infants will answer.

Where the danger is extreme, or the skin already abraded, it may be protected by covering with strips of soap-plaster, or by the application with a broad brush of a single coat of flexible collodion, or solution of gutta-percha. The pressure may be relieved by frequent changes of position, when such are practicable, by circular pads or air-cushions, or where the tendency is very marked, by the use of a water-bed. The latter equalizes the pressure, and is, in case of paralysis, or prolonged incontinence of urine, the only efficient safeguard.

The first symptom of a bed-sore evident to the patient is usually a pricking sensation, or a feeling as if he were lying on something rough. Or there may be no subjective indication whatever. A patient may be delirious, paralyzed, or too weak to complain, and a bed-sore be far advanced before it is discovered, unless constant vigilance has been exerted in this direction. On this account daily and careful examination should be made of such parts as are especially subjected to pressure, and the first discovery of reddening or roughening of the skin, or of pain on pressure, be accepted as a warning of serious import. If these symptoms pass unnoticed or uncared for, the discoloration will become deeper, and the inflammation progress until sloughing ensues.

After a bed-sore is actually formed, its treatment belongs properly in the province of the surgeon, but it is often delegated to the nurse. After the skin is broken it is customary to discontinue the use of spirit, or to dilute it, as, although still useful, it causes pain, and to dress with oxide-of-zinc ointment or vaseline. A mixture of tannic acid and oxide of zinc, a scruple of each, worked up into an ointment with an ounce of vaseline, is sometimes recommended. When a slough has formed, its separation is hastened by the use of charcoal or chlorinated poultices. As it becomes detached, it almost invariably reveals greater extent of injury than its superficial appearance would have led one to anticipate, often laying bare the deeper tissues even to the bone. Poulticing should not be continued longer than is necessary to remove the gangrenous portion, as it tends to soften and break down the neighboring parts.

Brown-Séquard advises alternate applications of heat and cold, an ice-bag for ten minutes, followed by a warm poultice for an hour. After the separation of the slough, the resulting ulcerated surface is treated with some stimulating and disinfecting remedy, as balsam of Peru, tincture of catechu, or carbolic acid, 1–40, applied on lint, only within the limits of the sore. An excellent application at this stage, is that known as Wood's mixture, equal parts of powdered catechu, red cinchona, and gum camphor, mixed into a thin paste with balsam of Peru. This makes an indelible stain. Tannic acid also stains. Iodoform, either in powder or in the form of an ointment, may be used.

Cover the lint with a piece of oiled muslin or rubber tissue, of a little larger size, and confine the dressings in place by adhesive strips, not by bandages. They must be renewed at least once a day, and the surface of the sore washed with some disinfectant solution before it is reapplied. Remove all pressure by circular pads. The general strength of the patient must be supported, and circulation as far as possible promoted, as the immediate cause of bed-sores is defective nutrition. If neglected, they may result fatally, as the constant discharge may prove too great a drain upon an already debilitated patient, or pyæmia may supervene from its reabsorption into the blood.

CHAPTER IV.

The blood—The heart—The blood-vessels—The general circulation—Pulmonary circulation—Collateral circulation—The pulse and its variations—Vital temperatures—Local temperature.

In view of the definition of health which we have quoted—*the perfect circulation of pure blood in a sound organism*—it becomes desirable for us to know something of the nature of pure blood, and of the means by which its circulation is carried on. It is the most abundant, as well as the most important fluid of the body,

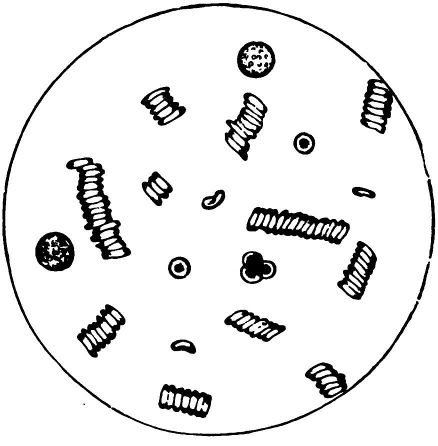


Fig. 2.—Red and white corpuscles of the blood. Magnified.

pervading nearly every part of the system; upon its presence and its unceasing motion, life as well as health depends. It appears to the naked eye as a simple red fluid, but examined under the microscope, it is seen to be made up of a multitude of little solid bodies, floating in a clear colorless liquid. They are called corpuscles, literally *little bodies*, and the liquid in which they float is known as plasma. The plasma is made up of serum and fibrin. The corpuscles are mostly of a yellowish-red hue, and it is from their vast numbers that the blood derives its red appearance. There are some white ones. They are larger than the red, and of a different shape, but comparatively few in number.

The blood while it circulates through the body is, though somewhat glutinous, perfectly fluid, but, upon removal from its natural surroundings, it exhibits a well-known tendency to coagulate or solidify. The fibrin of the plasma separates itself from the serum, and entangles the floating corpuscles into a mass. This peculiarity affords protection against undue loss of blood, for dangerous hæmorrhage would follow even a slight cut, did not the clots thus formed effectually close the injured blood-vessels and prevent further escape of the vital fluid. Occasionally this coagulation of the fibrin takes place while the blood is still in motion through the vessels, obstructing the circulation very seriously. This is called thrombosis. A clot so formed, or any other solid body, arrested in the arteries or capillaries, constitutes an embolus.

The office of the blood is to convey nutrition to all parts of the body, and to remove its waste material. The way in which it circulates was discovered, early in the seventeenth century, by William Harvey. The process is carried on by means of the heart, and blood-vessels of three distinct kinds : arteries, which carry the blood away from the heart ; veins, which bring it back to the heart ; and capillaries, connecting the two.

The heart is a pyramidal organ, situated nearly in the center of the chest. The apex, pointing downward, forward, and to the left, can be felt between the fifth and sixth ribs. The base is on a level with the upper border of the third rib. The base is fixed, but the apex is freely movable. The heart is composed of muscular fiber. It is enveloped in a fibro-serous membrane, called the pericardium, which secretes a lubricating fluid enabling its movements to be accomplished without loss of power by friction. It is hollow, and partitioned into four

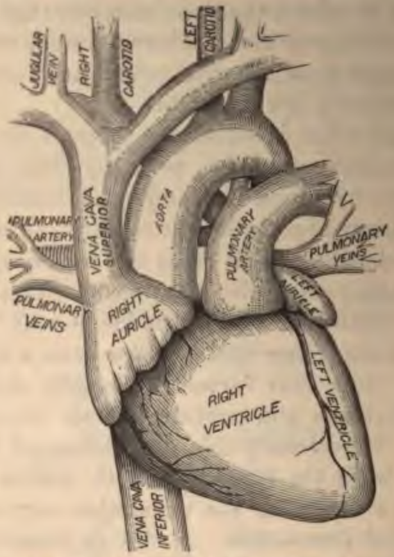


FIG. 3.—Heart and large blood-vessels.

cavities or chambers of nearly equal capacity, two at the base called auricles, and two below termed ventricles.

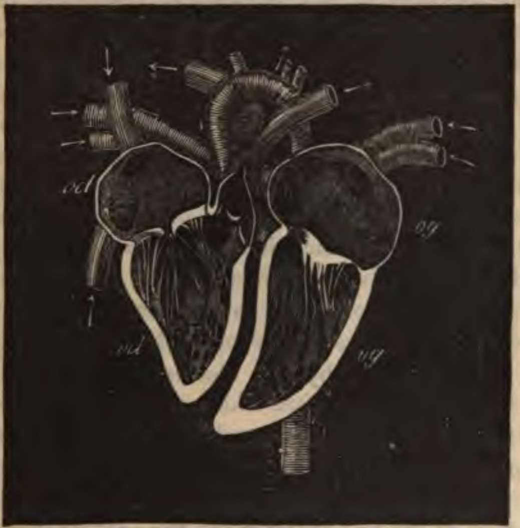


FIG. 4.—Cavities of the heart: *od*, right auricle; *vd*, right ventricle; *og*, left auricle; *vg*, left ventricle. The arrows indicate the course of the blood.

There is no opening between the ventricles. A valve between the two auricles closes at birth, and gradually disappears, after which there is no longer any connection between the two sides of the heart. The left side always contains pure, the right side impure, blood. If the valve between the two auricles fails to close when independent circulation is established, the impure blood mixes with the pure, and we get what is called a "blue baby," a condition soon fatal. But between each auricle and its corresponding ventricle there is an orifice, guarded by a valve, which permits the passage of fluid in but one direction—downward. The valve between the right auricle and the right ventricle, is called the tricuspid valve; that at the left auriculo-ventricular aperture, the bicuspid, or, more commonly, the mitral valve. Each ventricle has also another opening, provided with a set of "semi-lunar" valves, connecting it with a large artery, the aorta on the left, and the pulmonary on the right. The auricles also have other openings through which the blood flows into them from the great veins, but they are not supplied with valves. As the auricles become filled, they contract, and the blood, following the line of least resistance, is forced into the ventricles. They in turn similarly contract, forcing it on into the arteries, regurgitation being in each case prevented by the intervening valves. The sounds heard upon auscultation are produced by the closing of these valves. Then follows a pause, after which the contractions are repeated in the same order, and followed again by the same period of repose, during which the cavities undergo gradual dilatation. The pause occupies about as much time as the two contractions, the entire action less than one second. The state of contraction of the ventricle, or auricle, is called its systole, that of relaxation its diastole. Both sides of the heart act simultaneously.

Let us follow on its course the blood which is expelled by the left ventricle. The semi-lunar valves open to allow it to pass into the aorta, the main trunk of the arteries. This ascends from the upper part of the left ventricle for a short distance, then forms an arch backward over the root of the left lung, and passes down into the abdomen, where it is divided into two great branches. From every part of its length, it sends out similar branches. They all again divide and subdivide into numberless ramifications, extending to all parts of the body, and gradually diminishing in size as they become more and more remote from the heart. The blood receives an impulse from the ventricular systole, which sends it through the entire arterial system. The minute branches of the arteries empty their contents finally into an even smaller set of vessels known as capillaries. To call them *hair-like* is, however, an exaggeration, for they are so fine as to be invisible to the naked eye. Still they serve for the transmission of the microscopic blood-corpuscles. They interlace in every direction, making an elaborate network, and finally unite to form blood-vessels of the third order, the veins, which carry the blood back to the heart. These are at first extremely small, but, by constantly running together, they increase in size as they advance, until they finally all combine into two great trunks, the superior and inferior

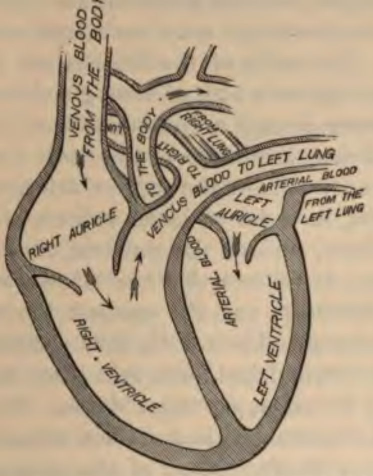


Fig. 5.—Diagram of the course of the blood.

venæ cavæ, which debouch into the right auricle of the heart. The veins returning to the heart follow closely in the track of the arteries which lead away from it, but they lie nearer the surface.

The smallest arteries and veins are quite similar in structure, but the larger ones have numerous points of difference. The walls of the arteries are composed of three coats: an outer one of strong connective tissue; a smooth inner lining, a continuation of the endocardium, the lining membrane of the heart; and between these a layer, which in the largest arteries consists of elastic tissue, in those of lesser caliber, of elastic and muscular fibers, and in the smallest, of the muscular fibers alone. It follows that the largest arteries have the most elasticity, and the smallest the most highly contractile power. Their walls have sufficient firmness to retain their cylindrical form, even when empty. They are always found empty after death. Veins, on the other hand, are less elastic, have but thinner walls, and collapse when empty. Many of the veins are supplied with valves, which permit the flow of blood only toward the heart. The capillaries are less complex than the other blood-vessels, consisting of but a single membrane, and that so thin that their fluid contents readily exude. The velocity of the blood decreases as it approaches the capillaries, its progress being delayed by the narrowness and intricacy of the path it has to travel. Time is thus allowed for the assimilation of the nutrient portion of the blood, by the living tissues with which it is here brought into intimate contact. As it enters the veins, its motion is again somewhat accelerated, though it never regains the speed with which it rushes through the arteries. Having once completed the circuit of arteries, capillaries, and veins, the blood is restored to the heart, and its general or systemic circulation is complete. It has, however, undergone a change in character and appearance during its stay in the capillaries; some of its elements have been appropriated, and it has become charged with waste matter, and lost its bright color. Before it can be fit for further use, it must be purified and renewed. To accomplish this, and to get back to that side of the heart from which it started, it has another journey to take. This, to distinguish it from the former, is spoken of as the lesser, or pulmonary circulation. From the right auricle, into which it is poured by the vena cava, the tricuspid valve allows the blood to flow into the right ventricle, the next contraction of which forces it by the pulmonic semilunar valves into the pulmonary artery, which leads to the lungs. This, like all the other arteries, is subdivided into numerous small branches, and finally establishes connection with a set of capillaries. In the pulmonary capillaries, the blood is brought near the atmosphere, and undergoes a process of renovation. The pulmonary veins then carry it back to the left auricle, ready to start again upon its double circulation. It will be seen that, in the pulmonary system of circulation, the general arrangement is so far reversed that the arteries become the bearers of the impure, and the veins of the pure blood.

The blood-vessels, branching in every direction, communicate in all parts of the body, so that, if the main course of the blood is interrupted, it may still go on its way by making a detour through minor ramifications. Such communication of vessels is called anastomosis. The collateral circulation which it allows, is of great surgical value, giving the possibility of ligating a large artery without obstructing the general circulation.

Each contraction of the heart sends out a wave which distends the blood-vessels, and which they, by their elasticity, carry on through the entire arterial system. This periodical distention is the pulse. Wherever an artery approaches the surface, the pulse-beats can be felt and counted. The pulse is a valuable guide in disease, as it varies with the condition of the heart, and affords an accurate index of its action. It is usually taken at the radial artery, just above the wrist, for convenience; if it becomes imperceptible there, it may perhaps still be felt at the temporal, femoral, or carotid, as large arteries retain their pulsation longest. In children, you may get it best in the temporal artery during sleep. It is often difficult to get a child's pulse anywhere when it is awake.

To take a pulse accurately, place two or three fingers along the course of the artery, making slight pressure, and count for a full minute, by tens. The rate varies with varying circumstances. Age, sex, food, temperature, position, exertion, mental states, and many other conditions, modify it even in health. It is usually more rapid in women than in men, in children than in adults. It is slow during sleep, quicker after taking food, more rapid standing than sitting, sitting than lying down. The average rate in a healthy adult is seventy-two beats per minute; in a child, one hundred and twenty.

Nearly all abnormal conditions of the body have some effect upon the pulse. Increase in the rate is more common than diminution. The character, as well as the frequency, is subject to variations. In a *quick* pulse, each beat occupies less than the usual time, that is, each wave is of short duration relatively to the pause between. When the volume of the pulse is greater than usual, it is said to be *large* or *full;* if less than usual, *small*. When the pulse can be easily stopped, it is said to be *compressible ; incompressible* when it can only be arrested with difficulty, or not at all. In an *irregular* pulse, succeeding beats differ in length, force, and character. In an *intermittent* pulse, a beat is now and then lost, the rhythm being otherwise regular. The intermittency may occur at regular intervals, as every tenth or twentieth beat may be lost, or it may be without any regularity. An intermittent pulse is occasionally observed in persons otherwise healthy. It is always a less serious symptom than an irregular one. Other departures from the normal standard, are variously described as *hard* or *soft*, *sharp*, *jerking*, *bounding*, *throbbing*, *shotty*, *thready*, *wiry*, *flickering*, *undulatory*, etc., the names of which sufficiently explain their effect to the touch. In the *dicrotic* pulse, a secondary wave of oscillation becomes exaggerated so as to be felt. An inexperienced person may mistake this for the primary wave, and so be led to count double the real number of beats. This pulse is often met in typhoid fever. In some cases the pulse in the two wrists will be different. When the beat occurs a little later in one radial artery than in the other, it is said to be *retarded*. This usually indicates aneurism.

The blood has still another function, that of keeping the body warm. Animal heat is generated by continual chemical change, in which the blood is an active agent. The bodily temperature in health remains nearly the same, about 98·4° F., in spite of the variations of the external temperature. The action of the skin keeps the heat from accumulating, and the arteries, under the influence of the nervous system, dilate or contract, and so assist in maintaining the equilibrium, by altering the rate of production to correspond with the loss of heat. Life is secure so long as the production and the escape of heat are evenly balanced.

There is a definite daily cycle of variations, amounting to one or two degrees. According to Quain, the temperature of a healthy adult reaches its highest point between 5 and 8 P. M., and is at its lowest from 2 to 6 A. M. A deviation of more than one degree from the normal standard, that is, above 99½°, or below 97½°, may be regarded as indicative of disease. There is only a range of about twenty degrees within which life can be sustained. A temperature above 108°, or below 93°, will prove almost invariably fatal. The danger is in proportion to the distance from the normal, and to the length of time that the condition continues. Temperature below the normal standard, is far more dangerous than the same number of degrees above, as the following table shows:

Hyperpyrexia	106°, and over, extremely dangerous.
High fever	103½°—106°.
Moderate fever	101° —103½°.
Subfebrile	99½°—101°.
Normal	98° — 99½°.
Subnormal	97° — 98°.
Collapse	95° — 97°.
Algid collapse ... below	95° —again extremely dangerous.

Most, though not all, morbid states, are accompanied by alterations in temperature, some of which are so typical as to be of great diagnostic value. Rise of temperature above 99½°, constitutes fever, or pyrexia. It is occasioned either by imperfect loss of heat, or by over production. The amount of heat produced, is proportional to the activity of respiration, and the amount of oxygen consumed. The pulse is generally accelerated in proportion to the elevation of temperature, though the proportion varies in different diseases. In scarlet fever, for instance, the pulse will be quicker than in typhoid with the same temperature. If the pulse is more rapid than the temperature will explain, it indicates cardiac weakness.

A change of temperature may be the first symptom of disorder, occurring even before indisposition is felt. It is of importance to get this first variation from the normal temperature; and as medical advice is not likely to be called for until more evident symptoms have manifested themselves, every mother as well as every nurse ought to own a clinical thermometer, and to know how to use and read it. She can do no harm, and she may do a great deal of good, by using it upon the first suspicion of a departure from health. A slight variation from the normal is of less serious import in a child than in an adult, unless it is found to be increasing. An increase, beginning each day a little earlier, is a bad indication; a decrease from a high temperature, beginning each day earlier, is a sign of improvement. The daily fluctuations take place also in disease, and are sometimes much exaggerated. Sometimes fever is continuously high, with only the normal amount of variation; or it may be remittent, that is, with a wide range between its highest and lowest points, though never sinking to normal; or intermittent, in which type the temperature alternately rises to febrile height, and falls to or below the normal. In some disorders, as pneumonia, and others similarly initiated with a chill, the rise will be rapid and sudden; in others, there will be at first but slight elevation, which gradually increases. Typhoid is of the latter class, the temperature rising about two degrees daily, but falling again each morning, so that the maximum mark is only reached on the fifth or sixth day. A febrile temperature may be expected to rise toward evening, but in rare cases the ordinary rule will be reversed, and there will be rise in the morning and remission in the evening. In some cases of typhoid and phthisis, two exacerbations have been observed in the twenty-four hours, with two distinct remissions. Such deviations can only be recognized by testing the temperature frequently. It will be evident that isolated observations have not the value of a regular series. The temperature should be taken at the same hour each day, to exhibit accurately the cycle of fluctuations. An irregularity in temperature, in the course of a disease which has usually a regular type, is indicative of some complication. Or it may depend upon local causes, and be removed with them. Thus constipation will often send up the temperature, which will fall again after its relief. Bad air may have the same effect. The decline of fever, or defervescence, may, like the rise, be gradual from day to day, or sudden, dropping to a steady normal in from six to thirty-six hours.

Temperature may be artificially reduced by applications of cold, or by antipyretic medicines; it may be brought up by external heat and stimulants. The former act most effectively at the times when the temperature has a natural tendency to fall, and the latter when the tendency is to rise, as the effort of nature is then assisted rather than opposed.

Any great modification of temperature is usually recognizable to the touch, but to measure its extent with mathematical certainty, the clinical thermometer is used. This now familiar little instrument is indispensable to every nurse. Before use the index must be thrown down to a point two or three degrees below the normal. Hold it with the bulb down, and shake until the mercury falls.

The temperature may be taken under the tongue, in the axilla, or groin, rectum, or vagina. The temperature of the interior of the body is more even, and somewhat more elevated, than that of the surface, so that, when it is taken in either of the natural cavities, the index will reach a point at least half a degree higher than in an artificial cavity. The mouth will be a little cooler than the cavities constantly closed, and the axillæ cooler still, and it will take longer time for the mercury to rise in these places, unless the precaution has been taken to keep the mouth or axilla previously closed for ten minutes, that they may have assumed a steady temperature. A little time may be saved by slightly warming the bulb in the hand before its introduction. Keep the patient well covered for some little time before taking an axillary temperature. The part should not have been exposed for washing or dressing for at least half an hour previously. The axilla must be first dried from perspiration, care be taken that the clothing is not in the way, and the thermometer held firmly in position. This is best done by pressing the arm closely to the side, and flexing it till the hand touches the opposite shoulder. Where great accuracy is needed, the thermometer should be left in place until the index has remained stationary for five minutes. In a very emaciated subject it may be impossible to get a correct axillary temperature.

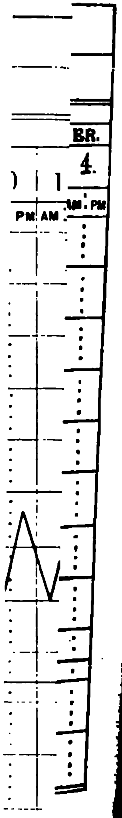
The temperature is frequently taken in the mouth, the bulb of the thermometer being placed under the tongue. This is not always safe, as there is danger that a child, or an irresponsible patient, may bite off the bulb. The lips must be kept closed during the process.

The rectum gives, perhaps, the most reliable temperature, as there are fewer possible sources of error. This method is always employed for infants. The tube should be oiled and inserted for nearly two inches. Remember that, if the rectum contains fæcal matter, the index will not reach so high a point as if the bulb comes directly in contact with the mucous membrane.

The length of time required to take a temperature depends not only upon the locality selected, but also to some extent upon the thermometer used. Some will do the work in three minutes, while others take five or ten, other things being equal. Every thermometer in use ought to be annually compared with some standard, as, after a time, it will cease to register correctly. The bulb gradually contracts a little, and too high indications result. Never leave a thermometer with a patient unwatched, unless you are very sure he is to be trusted to take care of it.

Inflammation sometimes gives a local rise of temperature, without affecting the general heat of the body. To test this, a surface thermometer is used, one with the reservoir flattened, so as to receive impressions from the open surface. The scale is the same as that of the ordinary fever thermometer, divided into degrees and fifths, but it is not self-registering. They usually come in pairs matched to work together; but this arrangement has only the advantage of saving time. One will answer every practical purpose. It is to be applied alternately over the seat of inflammation, and over some corresponding part known to be isothermal with it in health. The difference shows the amount of increase in the local heat. This, like the general temperature, will be found to fluctuate, exhibiting periods of exacerbation and defervescence.

Temperatures need not only to be accurately taken, but correctly recorded. Note degree and hour immediately upon taking, without leaving time to forget.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4.
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AM
AM
PM

Clinical charts are made to be filled up with the records of temperature; lines drawn from point to point, as the rise and fall are noted, give often very characteristic curves. The accompanying illustration is taken from a typhoid case:

CHAPTER V.

The lungs and air-passages—Respiration: its mode, object, modifications, disorders—The atmosphere: its vitiation and renovation—Ventilation, natural and artificial—Warmth—Modes of heating.

We have seen that the blood undergoes in the lungs a process of purification, rendering it fit for renewed use. To understand how this is accomplished, one must know something of the construction and working of the respiratory organs, the chief of which are the lungs, trachea, and muscles of the chest.

The lungs themselves are of a sponge-like substance, composed of air-cells lined by a network of minute blood-vessels. These blood-vessels are the subdivisions of the pulmonary veins and arteries. A series of bronchial tubes connect the air-cells with the external air, those of each lung uniting into a single bronchus, and the two finally with each other, to form the trachea, or windpipe. Each lung is enveloped in a delicate membrane called the pleura. This is, at the root of the lung, folded back so as to form also a lining to the chest. It secretes a fluid which keeps it constantly moist, and enables the two surfaces to slide easily against each other.

The chest is separated from the abdominal cavity by a muscular partition—the diaphragm—which alternately rises and falls, as its fibers contract and relax. The motion is involuntary, but partially under control. As the capacity of the chest is increased by the descent of the diaphragm, the additional space is filled by air, sucked in through the trachea and bronchi, and expanding the elastic cells. As the diaphragm rises, this extra supply of air is forced out again. The size of the thoracic cavity is still further affected by movements of the intercostal muscles, which elevate and depress the ribs. By these muscular actions, and the consequent expansions and contractions of the lungs, the alternate inspirations and expirations are produced which we call breathing or respiration. The lungs are not completely filled and emptied by each respiration. A certain amount of air is stationary in them. The additional supply drawn in

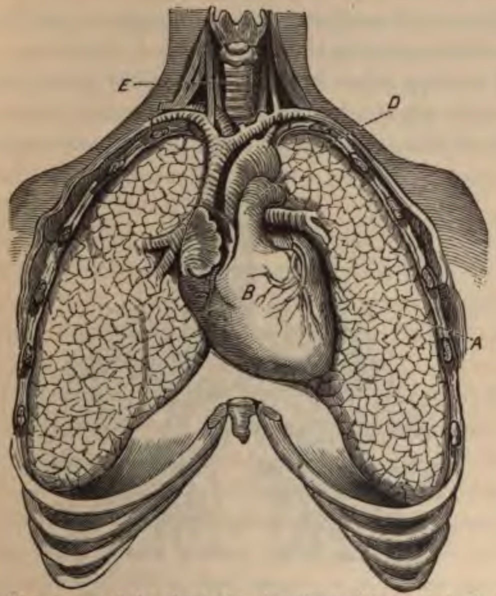


FIG. 7.—The cavity of the chest, showing the positions of the heart and the lungs: *A*, left lung; *B*, heart; *D*, pulmonary artery; *E*, trachea or windpipe.

and out, sometimes called tidal air, is but a small proportion of the entire contents of the lungs; but it is diffused through and alters the character of the whole. At the end of each expiration follows a period of repose about equal to the entire period of action.

A healthy adult ordinarily breathes about eighteen times per minute, taking in each time some twenty cubic inches of air. It takes, at this rate, sixteen respirations to completely renovate the air in the lungs. By this gradual introduction of the outer air its temperature is rendered more fit for contact with the delicate capillaries, and there is a reserve supply in case of any accidental embarrassment of respiration. It is worth noting that the habit of taking deep inspirations increases the strength and capacity of the lungs.

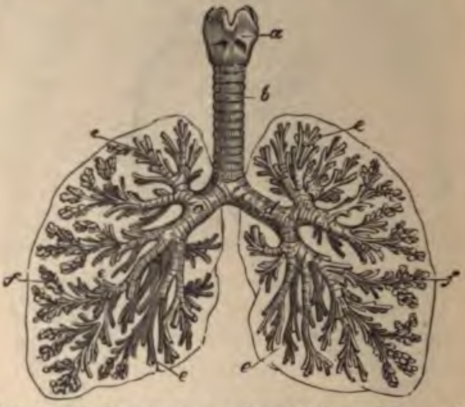


FIG. 8.—Lungs and air-passages: *a*, larynx; *b*, trachea; *c*, *d*, bronchi; *e*, bronchial tubes; *f*, lobules.

The direct object of respiration is the purification of the blood. Let us see just how this is effected. The air is a mechanical mixture of oxygen and nitrogen, with a small proportion of carbonic-acid gas and watery vapor. Its average composition is a little less than twenty-one volumes of oxygen, to seventy-nine of nitrogen. The nitrogen in the atmosphere acts simply as a diluent. The oxygen is the universal supporter of life, the vitalizing force of all animal organisms. Carbonic acid, on the contrary, is so poisonous a gas that two or three parts of it in a thousand will produce sensibly bad effects—as headache, nausea, and drowsiness. Five per cent may be fatal.

The walls of the air-cells consist of a mere film of mucous membrane, thin enough to allow interchange of gases to take place through it, though impervious to liquids. Such transudation of fluid through a moist animal membrane, is known as osmosis.

Oxygen has a stronger affinity for blood than for nitrogen; so, when it is brought near, it leaves the air inspired, to unite with the blood in the lungs. But carbonic acid and water—both of which are to be found in the blood—have greater affinity for air, and pass into it. So the air expired retains its nitrogen, and takes carbonic acid and water, but loses a part of its oxygen.

The processes of circulation and respiration are thus intimately connected, and whatever modifies the pulse affects also the breathing. There are usually four beats of the pulse to every respiration. The rate of respiration accordingly varies as does that of the pulse, being more rapid in woman than in man, in a child than in an adult, and modified by position, exertion, excitement, and other conditions; but, unlike the pulse, it is partly under control of the will. Respirations are best counted, when possible, without the knowledge of the patient, as, to be natural, they must be unconscious. They are somewhat slower during sleep. One can usually see the accompanying rise and fall of the chest; but, to count accurately, the hand should be laid flatly and lightly over the stomach, where the motion may be distinctly felt. Respirations below eight, or above forty, per minute, may be considered as indicative of danger. The character, as well as the frequency, is subject to variations. Breathing is in man abdominal, in woman chiefly thoracic. It may be regular or irregular, easy or labored, quiet or noisy, deep or shallow. Sometimes it presents very marked peculiarities. When each breath is accompanied by a deep snoring sound, it is said to be stertorous. Difficulty of breathing arising from any source, is called dyspnœa; total absence of breath, is apnœa. Dyspnœa arises when, from any cause, the quantity of air reaching the lungs, is disproportionate to the amount of blood sent by the heart for purification. The blood may be in an unhealthy condition, it may be congested in the pulmonary capillaries, or it may be sent too quickly. The air may be unfit to perform its work, or it may be shut out by disease of the lungs or air-passages. If the supply of pure air be in any way entirely cut off, asphyxia results—that is, the blood fails to be oxygenated, a condition necessarily fatal, if not soon relieved.

Carbonic-acid gas is heavier than air, so much so that when pure it can be poured from one vessel to another, like water. The air nearest the ground we might then expect to contain the largest proportion of this gas. It does not, however, so accumulate, owing to the diffusive power of gases, stronger even than the force of gravitation, which compels such as are in contact thoroughly to intermingle. The winds and the rain hasten this diffusion, and aid in the purification of the air. Still, with the whole animal creation constantly engaged in abstracting oxygen, and throwing off into the air a poisonous gas, some counteracting influence is necessary to prevent the entire atmosphere from becoming depleted, and unfit to sustain life. This is found in the vegetable world, which, under the stimulus of light, reversing the plan of the animal, absorbs carbonic-acid gas, and gives off in its place oxygen, thus securing the continual purification of the air. This circle of changes is perpetually going on: each of the great natural kingdoms deriving its own proper food from the atmosphere, and supplying in return the need of the other.

While we are out-of-doors, the products of respiration are continually carried away by atmospheric currents, while the lungs are as constantly supplied with fresh air. But in any confined space, this process is interrupted; the air is rapidly deprived of its oxygen, while noxious and irrespirable substances accumulate in its place, unless suitable arrangement is made for the constant renovation of the atmosphere. This accounts for the now familiar fact that the sick and wounded so often do better in the open air than in the best-constructed hospitals.

Dr. Barnes says, in his admirable "Notes on Surgical Nursing": "The most perfect form of hospital, in a sanitary view, would consist of a fine, dry table-land or very gently sloping hillside, while the ward and its fittings might consist of a hammock, a large umbrella, and a movable screen." He had in mind surgical cases particularly; but even for medical treatment his ideal outfit would have advantages, so true is it that bad air depresses the vital powers, predisposes to disease, and aggravates such as are already established.

The air during its stay in the pulmonary cavity acquires not only a dangerous proportion of carbonic-acid gas, but also organic impurities, waste matter thrown off from the blood, and from the lung substance. Thus vitiated, it is unfit to be again breathed.

The exhalations from the lungs are but one of the many causes conspiring to deteriorate the atmosphere. All the other excreta, notably that of the skin, lend their aid, and there are frequent sources of impurity external to the body. All combustion exhausts oxygen, and liberates injurious gases. A single ordinary burner of illuminating gas in a room, consumes more oxygen than would be required for three additional persons. Add to this the inevitable floating dust from floors and walls, from clothing, bedding, and furniture, and it becomes evident that with such impurities continually and from numberless sources arising, the question of the removal of the vitiated air, and the introduction of such as is in a fit condition for use, is one of the greatest importance, even under ordinary circumstances.

Where there is sickness it becomes a still more vital consideration, owing to the presence of organic matters in increased quantity, and of most deleterious quality, and to the reduced resistive powers of the system. A thousand cubic feet of air-space, constantly renewed, are necessary for a healthy adult. A sick person should have two or three times as much, as, while the air is more quickly contaminated, renewal must be less rapid, owing to the increased susceptibility to draughts. The above-named is the minimum supply to be allowed. Too much fresh air it is impossible to get.

The substitution of pure for impure air constitutes ventilation. There is happily a good deal of accidental ventilation through the impossibility of building a house perfectly air-tight, but it is very little in proportion to the need. Exchange of air spontaneously effected, as by doors and windows, is natural ventilation. It is mainly produced by inequalities in temperature, within and without, which set the air in motion. Artificial ventilation may be either by extraction or propulsion. A chimney with an open fire is a common type of the extraction method. The forcible introduction of fresh air by fans exemplifies that by propulsion. The former is at once the simplest and most effective. There is no better apparatus for ventilation than an open fire. The draught which it creates carries the air from the room up the chimney, while a fresh supply is drawn in to take its place. It is most important to know where this supply comes from. If there is no sufficient inlet from out-of-doors provided, it may be sucked in from some adjoining apartment or passage, itself so imperfectly ventilated, as to afford no better air than that the place of which it takes. A strong draught through a room does not prove it well ventilated, unless one can be sure that the inward flow is from some source whence there is no danger of additional contamination. There must be direct connection with the outside air, and the higher the points of admission, the purer is it likely to be.

Two constant currents are necessary—one outward removing the impure, and one inward supplying pure air. Inlets and outlets should be of equal capacity, on opposite sides of the room, and at different heights, to secure thorough distribution. It is best to have them small and numerous, giving rise to many and moderate currents. They should be as far as possible from the patient, and from each other. It is, of course, much more difficult to thoroughly ventilate a small room than a large one, and the liability to injurious draughts is greater.

It is impossible to keep the air of a sick-room absolutely as pure as that outside. That is, however, the ideal condition, and the one to which the nurse should aspire. In a large hospital the mutually involved subjects of ventilation and warmth, come but little under the control of the nurse. You will have only to observe and report any departure in your ward from the proper standard. In private nursing the matter comes more fully under your own management, and to keep pure the air of the sick-room, is a most important part of your duty. It is one in the accomplishment of which you are likely to find many difficulties. You will have to contend with a popular prejudice against fresh air, unfortunately not altogether confined to the uneducated classes, and also with the real danger of chilling the patient There are some cases in which open windows in the sick-room itself, are inadvisable in very cold or damp weather. There is still the necessity for keeping the air fresh and wholesome, and it requires even more than usual care and watchfulness to do this. The air must be admitted from outside into some adjoining room, and then be warmed before it is allowed to reach the patient. In all ordinary cases, however, the windows may be kept open, more or less, day and night, without danger. Ventilation during the night, is not less important than during the day, though the air must be more cautiously admitted, having missed the warming and purifying influence of the sunshine. It is still infinitely to be preferred to the poisoned atmosphere of a close, inhabited room, and must not be altogether shut out. Cold is greatest, and the body least able to resist it, in the early morning, just before daylight; but it is more heat, not less air, that is called for. Instead of closing the windows, and adding the benumbing effect of carbonic-acid poisoning to that of cold, stir up the fire, and give your patient additional clothing and foot-warmers. If there must be a choice of the two evils, air too cold will in most cases do less harm than foul air. In warm weather, when open windows and doors are matters of course, there is but little difficulty in obtaining an abundant supply of fresh air. But it is a too little appreciated fact that the necessity is none the less in the coldest weather. It is a common error to confound cold air with clean air, and to suppose that ventilation can be measured by a thermometer. Changes in the quality of the air, are not so sensibly felt as changes in its temperature; the more care is needed to guard against them. No thermometer registers its deterioration; the only test ordinarily practicable is by the sense of smell. A "sick-room odor," perceptible upon entering from the fresh air, is incontrovertible evidence of poor ventilation. It is obviously desirable that a nurse should have a good nose; but after a short time spent in a vitiated atmosphere, its sensitiveness will be lost, and not at once regained even out-of-doors, so that it ceases to be a reliable guide. One can not be too watchful, for there are few more mortifying occurrences for a nurse, than to have the doctor come in from outside, and remark, "Your room is close."

Even in the coldest weather, windows may be frequently thrown wide open for a few moments at a time, the patient being meanwhile protected by additional covering. A large umbrella opened, with a shawl or blanket thrown over both it and the patient, has been recommended as affording an effectual screen. If the patient is able to move about, advantage should be taken of every occasion when he leaves the room, to ventilate more thoroughly than can be done in his presence. But do not depend entirely upon such occasional opportunities. The contamination of the air is continuous; its purification should be equally so. There are numerous simple devices for opening windows and at the same time protecting the patient from direct draughts. The lower sash may be raised, or the upper one lowered, and the entire opening closed by a board an inch thick. The current of air then enters only in the middle, between the two sashes, and is given an upward direction. Or, placing the board on the window-sill, a little inside of, and extending somewhat higher than the opening, similarly directs the current, and gives two apertures for the admission of air. A wire screen serves a useful purpose by minutely subdividing the current of air before allowing it to enter. Much better for purposes of ventilation than the ordinary sliding-windows, are those hinged at the lower edge and opening inward at any desired angle. A deep window-frame prevents side draughts. Currents of cold air should be always first directed upward.

As has been suggested, the best method of securing an outward flow of the foul air is by an open fire. In a large room it may be insufficient for heating; but other appliances ought to be supplementary to, not substitutes for this. If it is too warm for a fire to be desirable, a lamp burning on the hearth is good to create a draught. Extraction flues must in some way be heated, or they will not draw. To allow open windows, there must be a surplus of heat. Economical housekeepers will sometimes object to "heating all out-doors," but it is an economy in the wrong direction. Stoves assist ventilation in the same way as grate-fires, though not to the same extent, by drawing off the foul air. A pan of water should be kept on the stove, to dampen the air by its evaporation. Heat without moisture is injurious, a certain amount of watery vapor being essential to the wholesomeness of the air. Furnace-heat is especially dry; radiators are still worse, and give no aid in ventilation.

Patients with pulmonary disease often find, to their surprise, that they breathe with less difficulty in damp and foggy weather, than on a clear, dry day. Such may derive considerable relief from a kettle of water kept boiling vigorously in the room. A large sponge, or towel, hung in front of a hot-air register, and kept wet, will also sensibly dampen the atmosphere. In all disorders of the respiratory system, if no special directions are given by the physician, keep the room at a temperature of from 70° to 75° Fahr.; in purely febrile disease, 65° is more suitable; for other cases, 68° is a good point. Whatever temperature is decided to be best, should be steadily maintained.

It is to be remembered that there is especial necessity for warmth in children, in the very aged, and in cases of diarrhœa. It is of far greater importance to keep the sick-room warm when the patient is out of bed than when he is in it. People rarely take cold under the bedclothes. Convince your patient of this, if possible, and, observing all precautions against the possibility, do not allow any prejudice, either on his part or that of his anxious, but ill-instructed friends, to prevent you from giving him an ample supply of fresh, pure air. Remember, that the lungs can not, in any confined space, fulfill their office of purifying the blood, and removing its waste particles, unless provision is made for the constant renovation of the air. This can hardly be too much emphasized. There are three important rules in regard to ventilation: sufficient pure air must be introduced; the foul air must be removed; these ends must be achieved without injurious draughts.

CHAPTER VI.

Observing and reporting symptoms—General physiognomy, attitude, and expression—The vital signs, and allied symptoms—The skin —The eye and ear—The digestive tract, etc.—Nervous phenomena —Sleep—Associated symptoms—Bed-side notes.

A GREAT point of distinction between the trained and the untrained nurse is, or should be, the ability of the former to observe accurately, and describe intelligibly, what comes under her notice. The nurse, who is with her patient constantly, has, if she knows how to make use of it, a much better opportunity of becoming acquainted with his real condition, than the physician, who only spends half an hour with him occasionally. The very excitement of his visit will often temporarily change the entire aspect of the patient, and make him appear better or worse than he really is. In order to form correct judgments, it is necessary for the physician to know what goes on in his absence, as well as in his presence, and for such information he is forced to rely almost wholly upon the nurse. It is thus of the greatest importance that she cultivate the habit of critical observation, and simple, direct, truthful statement. Even where there is no intent to deceive, very few people are capable of making a report of anything which shall be neither deficient, exaggerated, nor perverted. The doctor wants facts, not opinions ; and a nurse who can tell him exactly what has happened, without obscuring it in a cloud of vague generalities, hasty inferences, or second-hand information, will be recognized as an invaluable assistant.

The phenomena which accompany disease are termed symptoms. Symptoms may be classified as subjective, those which are evident only to the patient; objective, which may be appreciated by outside observers; and simulated, feigned for purposes of deceit, either to excite sympathy, or from other motives. It requires both experience and judgment to enable one to distinguish between real and feigned symptoms. An expert malingerer will now and then deceive an entire hospital staff into the treatment of a malady that has no real existence; while, on the other hand, genuine suffering may chance to be mistaken for fraud, or hysteria, if the usual objective manifestations are absent. The difficulty of determining the false from the true is often very great, especially where, as is frequently the case, there is an undoubted basis of fact. Entirely subjective symptoms may always be regarded with some degree of suspicion, as disease unaccompanied by any outward sign is comparatively rare. It is better to be duped once in a while than to fail to give aid or sympathy where it is really needed; but, without letting the patient feel that he is being watched, let nothing pass unseen, note the most fleeting signs, and, if you have any quickness of perception, you will soon get an impression of his mental attitude, as well as his physical state, and can judge to some extent whether his statements are to be relied upon, and whether he has a tendency to exaggerate his ills, or to make light of them.

To decide as to the existence of disease, of course belongs solely to the doctor, but he will be largely guided by the observations of the attentive nurse, and she herself will often be called upon to judge as to the urgency of special indications. Shall she send for the doctor in the middle of the night, or apply her own resources? shall she give or withhold the medicine left to be used only in emergency? shall she alter or let alone an arrangement which has proved unexpectedly uncomfortable? are questions constantly arising. The nurse needs to be able to discriminate between the important symptoms, and those which are merely incidental—to recognize those which call for immediate action, and to know what kind of action on her part is called for.

When you have acquired the habit of observation so necessary for you, you will, in the first glance at a new patient, get an idea of his general physiognomy, and any prominent peculiarities; closer investigation will reveal more minute particulars.

Try to learn all you can of the previous history of the case; you will sometimes get valuable points which the patient would hesitate, or not think of sufficient consequence, to mention to the doctor in person.

Note the patient's apparent age, with any indications of premature or disguised age, signs of weakness, size, whether well or ill nourished, emaciated, corpulent or bloated, and any deformities, swellings, or wounds.

Attitude and expression are sometimes very characteristic, giving valuable indications. A sufferer instinctively takes the position most calculated for ease. Thus, when one lung is affected, the patient lies on that side, that the healthy one, which has to do most of the work, may have the greatest freedom of motion. Lying on the back, with the knees drawn up so as to relax the abdominal muscles, suggests peritonitis. With colic, on the contrary, you may find the patient lying on the abdomen, as pressure relieves pain of such character. When a patient who has lain persistently on his back, turns over to the side, it may be looked upon as a sign of improvement. There is no surer indication that the distress of dyspnœa is removed than for a patient, who has been forced to sit up, to lie down and compose for sleep. The inability to breathe lying down is termed orthopnœa. It occurs in affections both of the lungs and of the heart. Lying quietly is usually a favorable sign; but, in acute rheumatism, the patient is quiet because the least motion causes pain. Again, extreme weakness may render it too great an exertion to move. Restlessness is ominous in most organic diseases. Slipping to the foot of the bed is sometimes a very bad sign.

A pinched and anxious look is often the forerunner of serious mischief, while a tranquil expression is usually of favorable import. Sudden lack of expression, apathy, or immobility of features, is a bad symptom. In facial paralysis, expression will be totally absent from half the face, or it will be drawn and distorted—the healthy side being the one thus affected.

Some painful abdominal affections are accompanied by a sort of sardonic smile—*risus sardonicus*—from contraction of the muscles of the mouth. Any such contortion of feature is noteworthy, as also extreme thinness or swelling of the lips, and excessive action of the nares.

The most important indices of disease are the pulse, respiration, and temperature, sometimes called the three vital signs. They have already been discussed under their several heads. The three are intimately associated, and correspondingly affected. The frequency, rhythm, and force of the pulse are to be carefully observed, and its relations to other symptoms. Note the rate and any peculiarities of respiration, whether it is most abdominal or thoracic, if regular or irregular, easy or labored, and whether or not accompanied by pain. There is no pain in disease of lung-substance alone; when the pleura is involved, there is sharp pain. In bronchitis or asthma there is difficulty in breathing, evident muscular effort; in pneumonia it is rapid, but perfectly easy and quiet. Dyspnœa is common from various causes. There is one very peculiar form of it, known as the Cheyne-Stokes respiration, in which the inspirations, at first short and shallow, become by degrees deep and difficult up to a certain point, and then again more and more superficial until they entirely cease. After a pause of from a quarter to half a minute, the same series of phenomena are repeated in the same order. This is a curious, and generally a fatal, symptom.

Cautious respiration indicates lung trouble of some kind. Œdema of the lungs, the presence of fluid in the air-passages, is evidenced by rattling and shortness of breath. The sounds produced by the passage of air through the fluid in the air-cells, bronchi, or cavities, are known as râles.

Most disorders of the respiratory organs are accompanied by cough. This is caused by irritation of the air-passages, and is often an effort at the expulsion of a foreign body. Matters coughed up are called sputa. Cough not accompanied by expectoration is said to be dry. The character of the expectoration varies with different diseases. In bronchitis it is at first simply mucous, later it may become purulent: in chronic cases it is thick and yellow. The sputa of phthisis are at first tenacious and ropy, sometimes frothy, at an advanced stage becoming purulent and streaked with blood. With pneumonia, the expectoration is for the most part scanty; after a certain stage, it has a characteristic rust color, and a tenacious, tough quality. Gangrene of the lung gives dark, greenish sputa, very copious and offensive. Cancer of the lung has a peculiar gelatinous form. In children, the sputa are often swallowed ; if thrown up mixed with food, they may be known to come from the stomach.

Note whether mucus accumulates during the night, and the time of day when the cough is the worst ; if it is increased by moving, or on first waking ; the character of the cough, whether hard or loose, choking, short, incessant, or paroxysmal. Note frequency, duration, and intensity of paroxysms, and if followed by exhaustion, or perspiration. The brazen ring of whooping-cough is well known and unmistakable. In laryngismus stridulus, a spasmodic affection of the glottis, there is a peculiar crowing sound. Hoarseness, or aphonia, failure of voice, may arise from disorder of the respiratory tract. Singultus or hiccough, a spasmodic contraction of the diaphragm, ordinarily of small account, is an important and unfavorable symptom toward the close of an acute disease. Yawning, sighing, and sneezing, are sometimes noteworthy as sympathetic phenomena.

If a patient complains of cold without apparent reason, take his temperature. A sense of coldness along the spine is often the precursor of a chill, and the temperature will be found elevated rather than lowered. Chills, or rigors, are nervous phenomena ; although the patient is shivering, the temperature rises, because the capillaries are so much contracted that the blood can not get to the surface to be cooled. High fever always follows a genuine chill. Chills may usher in acute disease ; if they occur in the course of inflammation, they probably indicate suppuration ; in malarial affections, they are severe and prolonged, but not dangerous. The temperature should be taken both during and soon after a chill—the time of occurrence, duration, number, and degree of severity, all be carefully noted.

With a fall of febrile temperature, there is apt to be profuse perspiration. Extreme weakness and other causes often produce the same result. The degree of moisture or dryness of the skin, is always an important point. A high temperature with a wet skin, is much more alarming than the same temperature with a dry skin. Note in what part of the body moisture appears, at what time, in connection with what other symptoms, whether it is cold or warm, and if there is any peculiar odor about it.

The skin affords other conspicuous signs as well. Variations from a healthy color will at once attract attention. The yellow tinge of jaundice is well known, indicating disordered action of the liver. With anæmia there is a peculiar paleness; in Bright's disease a waxy complexion. Chronic opium-eaters may often be recognized by their sallow skin, taken in connection with other appearances.

A red color shows excess, or suffusion, of blood, and a cyanosed or bluish shade, imperfect purification. In pulmonary disease, there is often high color of one cheek alone. Sudden change of color may give warning of syncope. Paleness about the mouth, with compressed or slightly parted lips, indicates nausea. Patches of color, flushing, dark circles under the eyes, have each their significance. Any eruption or rash must be especially noticed, and promptly reported, its character, location, extent, time of appearance, and associated symptoms. Of less consequence, but still to be taken into account, are scars, parasites, the cleanliness of the body, any roughness of the skin, etc. Scaling off of the cuticle is called desquamation. This takes place generally in the course of scarlet fever, and some other diseases. Attention will probably be called to any local irritation, or unnatural sensation, as burning, tingling, itching, numbness, or crawling. Early signs of bed-sores can not be too carefully watched for. The condition of wounds must receive attention ; blushing or puffiness of the surrounding parts, sudden stoppage or alteration in the quality of the discharge, should be reported at once.

The eye, besides its own local affections, may give signs of general disorder. It may appear unduly prominent or sunken, there may be altered color or inflammation of the conjunctiva, disturbances or loss of vision. Observe the size of the pupils, if one or both are contracted or dilated. Squinting, if habitual, is of no importance ; but if it comes on in the course of brain disease, it is an unfavorable symptom. Note any swelling of the eyelids, drooping or tremulous movement of them, fear of light, apparent weakness, and over-secretion of tears.

The sense of hearing may be preternaturally acute, or, more commonly and less significantly, defective. The former condition sometimes precedes delirium. Subjective disturbances of hearing may arise from congestion of the cerebral blood-vessels. Some drugs, notably quinine, produce this effect. Any discharge from the ear should be noted, its character and amount.

Taste, like the other special senses, may be impaired or vitiated. With a disordered liver, there is often a bitter taste ; in phthisis, one of salt ; and under some medicinal treatment, a decided metallic flavor. The sense may be entirely destroyed for the time ; is rarely over-acute. The tongue offers many valuable indications, for it sympathizes not only with the digestive organs, but to some extent with the whole system. Note if it is dry or moist, clean or coated, swollen, bitten, or indented by the teeth. With fever, the tongue is likely to be furred; but this is not always a sign of disease, for some people in good health have a furred tongue constantly, or induced by slight constipation. The fur may be white, yellow, or any shade of brown to nearly black. When the fur begins to grow thin, and clean up from the edges of a fevered tongue, it is a better indication of convalescence than when it clears in patches, or rapidly, leaving a raw or glossy surface. In scarlet fever, there is often a characteristic appearance known as the "strawberry-tongue," a bright red with the swollen papillæ showing prominently through the fur. So the swollen and livid tongue of typhus is sometimes described as a "mulberry-tongue."

Take the opportunity, in looking at the tongue, to notice also the odor of the breath, and the state of the teeth and gums. Looseness of the teeth, and sore gums, are to be watched for while giving mercurials. Salivation, or ptyalism, an over-abundant secretion of saliva, is occasioned by some other drugs as well as mercury, and sometimes occurs spontaneously. At the commencement of acute disease, this secretion is more likely to be diminished in quantity and thickened. With high fever, the teeth, if not well cared for, may become covered with an accumulation of dark-brown matter, known as sordes. A dark line appearing along the edges of the gums is a thing to call attention to. Aphthæ (thrush) are to be looked out for in infants, and sometimes occur also in adults in an advanced stage of disease. White patches in the throat are always ominous. Slight sore throat not infrequently accompanies indigestion, or a cold.

The state of the appetite is an important point. Nearly all acute diseases occasion loss of appetite. An increased appetite, bulimia, is more rare, but may exist even with an inability to retain food. The appetite may be vitiated, desiring improper food ; but, as a rule, a longing for particular things shows a need of them which ought to be gratified. Observe with special care how much food the patient takes, what kinds of food are most acceptable, and, as far as you can, the effects of each.

Thirst may remain when the appetite is completely lost. It almost always exists in acute, seldom in chronic disease. A very common symptom is nausea. It is usually relieved by vomiting. Note if it is persistent, if vomiting is accompanied by straining or pain, the interval since taking food or medicine, the amount and character of the vomited matter. This will be generally undigested food ; it may contain bile, blood, or even fæcal matter. The presence of the latter constitutes stercoraceous vomiting. An appearance like that of coffee-grounds is sometimes caused by the admixture of a small quantity of blood. The "black-vomit" of yellow fever has something of this character. When blood is present to any extent in vomited matter, it is usually found also in the stools, giving them a dark color and tarry consistency. Some drugs, as iron and bismuth, also blacken the stools. With jaundice, they will be very light, clay-colored. It is important to note the frequency and quantity of the evacuations, if solid or liquid, any unnatural odor or appearance, the presence of mucus, pus, blood, or worms. Tenesmus—a constant desire to empty the bowel, with pain and inability to do so—is a distinguishing symptom of dysentery. Constipation is very common, and is often produced by over-use of cathartics or clysters. Diarrhœa may exist even with impacted fæces, the patient having frequent small movements without unloading the bowels. What is passed under such circumstances will be either fluid, or small, dark, hard masses, known as scybala. This is important to remember, for a nurse is too apt to have the idea that the patient's bowels must be all right if they move daily, without regard to the quantity passed. Eructations of gas, borborygmi, rumblings in the intestines, and tympanites, distention of the abdomen by gas, are all noteworthy, as also dysuria, painful passage of urine, and suppression, retention, or incontinence. The latter is no evidence that the bladder is empty. There are many important indications to be derived from the urine which will be spoken of later.

In women, the menstrual function calls for special observation ; the regularity in the appearance of the catamenia, whether accompanied, preceded, or followed by pain, and any related phenomena.

Hæmorrhage from any organ is always more or less important. Even a nose-bleed may be an initial symptom of typhoid. The color, quantity, and general character of any discharge are to be carefully observed.

Pain is always a subjective symptom, though most often accompanied by others which are objective. Pain implies life and reaction, and its absence is not always a favorable indication. With an extreme degree of shock there is no pain. Sudden cessation of pain during the progress of severe organic disease, generally heralds the approach of death. Pain may be inflammatory or neuralgic ; the former is increased by pressure, the latter relieved by it. Get the patient to describe the kind of pain he feels, as well as to locate it; to tell whether it is acute, dull, aching, stinging, burning, steady, spasmodic, etc. Exaggerated sensibility is called hyperæsthesia; diminished or lost sensibility, anæsthesia. Either may be general or local. Partial anæsthesia is often conjoined with loss of muscular power—paralysis. If the lower half of the body is so affected, it is called paraplegia; paralysis of the lateral half is hemiplegia. In hemiplegia the temperature may be found a degree, or a degree and a half, higher on the paralyzed side than on the other. Aphasia, loss of the power of speech, occurs most often in connection with right hemiplegia.

Incoherence of speech, muttering, slowness of comprehension, loss of interest, unusual irritability of temper, difficulty of swallowing, a tendency to spill food or drop things, and picking at the bedclothes, are all symptoms of gravity. Involuntary muscular contractions vary from slight spasms, as cramps, to severe convulsions. Subsultus, twitching of the muscles, and many little nervous motions may be so classed. Note the frequency and persistency of movement, if the convulsions are general, or confined to one part of the body, whether or not the patient is unconscious, if the attack is sudden, and the mental state before and after it.

Under disorders of consciousness are included all sorts of delusions and hallucinations, delirium, and stupor. Note the kind of delirium, if quiet, busy, or maniacal; if persistent, or only occasional, and when it is most violent. Try if the patient can be roused from stupor. Complete insensibility, from which the patient can not be awakened, is known as coma. Profound coma, which does not terminate within twenty-four hours, may be regarded as almost certainly fatal. Continuous sleeplessness, with partial unconsciousness, constitutes coma-vigil, also an almost invariably fatal symptom. Insomnia is always ominous in proportion to its duration. It is important to note how much sleep a patient gets, at what time, whether it is quiet or disturbed, the occurrence of dreams, talking in sleep, etc. A patient will often think he has been awake all night, when, in fact, he has had several hours of sleep without realizing it. The nurse should be able to state the facts accurately.

The degree of intensity of all symptoms, the time and order of appearance, and the combinations, are to be observed. Often a symptom, which by itself would be insignificant, becomes in its relations with others of grave import. If uncertain whether a circumstance is of any value, still make note of it, for it is better to report to the physician a dozen superfluous items, than to omit one of importance. Do not trust too much to memory, but keep a little memorandum-book in which to note facts, and take down orders. A sheet of foolscap ruled, after the following plan, gives a good form for bedside notes.

BEDSIDE NOTES.

DATE, ____________ DAY OF DISEASE, ____________

NAME ____________

PHYSICIAN, ____________

Time.	Pulse.	Respiration.	Temperature.	Medicine.			Nourishment.			Sleep.	Urine.	Defecation.	Remarks.

Summary:

Nurse, ____________

CHAPTER VII.

Modes of administering medicines—Medication through the skin—Hypodermic injections—Inhalations—Medication by the stomach—Preparations of drugs—Care of medicines—The nurse's responsibility—Peculiar actions of drugs—How to disguise disagreeable tastes—Doses for children—To give medicine by force—Measurements—Abbreviations—List of drugs in common use.

MEDICINES may be introduced into the system either through the skin, the mucous membrane, or the subcutaneous tissue, with the same constitutional results, but differing in degree, and in the time required to produce them.

There are three ways of introducing medicine through the skin, known respectively as the enepidermic, the epidermic, and the endermic methods. In the first, the medicinal agent is simply placed in contact with the skin to be absorbed, so far as may be, by it. If friction is employed to hasten absorption, the method becomes epidermic. In the endermic method, the cuticle is removed by blistering, and the medicament sprinkled over the raw surface. Absorption is then much more rapid. This is now but rarely practiced, as, although sometimes effective, it is painful and somewhat uncertain.

Endermic medication has been largely superseded by hypodermic or subcutaneous injections. These the nurse will so frequently have to give, that she must be thoroughly familiar with the process. There are two quite different ways: the needle may be inserted into the cellular tissue just beneath the skin, or plunged deeply down among the muscles. The latter is known as the deep, or parenchymatous, method, and seems to be gaining ground over the other, as it is said to be less likely to produce irritation, and the abscesses which occasionally follow hypodermic injection. There is also less danger of injecting the fluid into a vein. There are several precautions to be observed. A new syringe should be compared with a standard minim-glass, as the measurements vary considerably, and accuracy is highly important. See that it is in good working order, does not leak, and that the needle is sharp and unobstructed. Having carefully measured the amount to be administered, hold the instrument with the needle upward, and force out any bubbles of air that may remain in it. Then pinch up a loose fold of flesh between the thumb and finger, and insert the needle quickly to the extent of an inch. Withdraw it slightly, then inject slowly the contents of the syringe. After removing the needle, keep a finger on the point of insertion for a moment, to prevent the escape of the fluid. Gentle rubbing will hasten its absorption. Hypodermic injections are given to relieve pain, or induce sleep, and when speedy action of a drug is important. Remedies introduced in this way act more powerfully, and more rapidly, than in any other, and the operation, if skillfully performed, is but slightly painful. The liability to the formation of abscess, is said to be least where morphia is used. Abscesses are in most cases due either to carelessness in injecting, to the use of a syringe not thoroughly clean, or to an impure solution, but occasionally are unavoidable, resulting from a lowered condition of the system, which predisposes to inflammation upon slight irritation. A dilute is less irritating than a concentrated solution.

As a matter of convenience, hypodermic injections are usually given in the arm, but other parts will do as well. The distance from the seat of pain makes no difference, as the effect is systemic, not local. Bony prominences and inflamed parts are to be avoided, and caution observed against puncturing a vein. Death has resulted from the introduction of a solution of morphia directly into a vein. Intravenous injection is occasionally practiced, but only by the physician, and its consideration, except as a thing to be avoided, does not enter into the province of a nurse. Medicines, to be given subcutaneously, must be perfectly dissolved, and free from the slightest impurity. Solutions too long kept develop a fungoid growth, which renders them unfit for hypodermic use. It is much better to prepare them only as needed. A little benzoic or salicylic acid, one grain to four or five ounces, may be added to the solution of morphia to preserve it.

Aqua-puncture consists in the hypodermic injection of pure water.

Some general effects, as well as those locally upon the throat and lungs, may be obtained by inhalation. In this way anæsthesia is induced by chloroform or ether. Volatile substances to be inhaled may be simply evaporated from a piece of cloth or cotton held near the nostrils. Others can be finely subdivided by a hand or steam atomizer throwing the spray into the mouth. The patient should be directed to breathe quietly, without extra effort. A simple and convenient device for the inhalation of steam, or medicinal vapor, is a pitcher of hot water, having closely fitted over it a cone of thick paper, with an aperture at the top through which the patient may breathe. He should inhale by the mouth, and exhale through the nose. The temperature of the vapor should not exceed 150° Fahrenheit. It is made medicinal by the addition to the hot water of prescribed drugs.

The most common mode of introducing medicines into the system is through the mucous membrane, generally that of the stomach. Applications to other parts of it are more frequently for local effect, and will be spoken of elsewhere.

Medicines are taken into the stomach in various forms of pills, powders, and solutions. Some patients find an almost insuperable difficulty in taking pills. The smaller the pill, the harder it is to swallow, and if its size is increased by enveloping it in bread or jelly, the trouble will often be overcome. Place it as far back in the throat as possible, and follow immediately with a large swallow of water. Pills that have been long kept become very hard, and, if taken in that condition, may pass through the intestinal canal undissolved, and so without effect. If nothing better can be procured, they should be pounded up, and given like powders, in water, milk, or sirup. A small powder may be concealed between two layers of jam or marmalade, and swallowed without difficulty. Powders insoluble in water, as calomel or bismuth, may be placed dry on the tongue, and a drink taken to wash them down. Those of objectionable flavor are frequently inclosed in wafers of rice-paper or dough, or in capsules of gelatine, either of which will dissolve and liberate its contents in the stomach.

A very large pill is called a bolus.

An electuary is of the consistency of stiff jam.

A mixture is a suspension in some vehicle of an insoluble substance.

An emulsion is a mixture of oil and water, made by rubbing up with gum.

A decoction is a solution of a vegetable substance made by boiling. Decoctions, as a rule, do not keep well, and should be freshly made at least once in forty-eight hours. To an ounce of the crude drug, add fifteen ounces of water, and boil down to ten ounces.

An infusion is a similar preparation made with hot or cold water, without boiling. One ounce of the drug to ten of water is now the rule.

Spirits are alcoholic solutions of volatile substances.

Tinctures are alcoholic solutions of non-volatile substances.

Fluid extracts are like tinctures, but stronger.

A saturated solution of any substance is one that contains all that can be dissolved in it.

All bottles should be distinctly labeled, and one should never omit to carefully read the label before measuring the dose, and again afterward. Attention to this rule would have prevented many serious mistakes. In pouring, keep the label on the upper side, to avoid defacing it. Remedies for external use are now often put up in fluted bottles of colored glass, recognizable to touch as well as sight. For the same purpose, it is recommended to tie a bow of ribbon around the necks of the bottles containing them. No medicine should ever be given in the dark. Always shake before opening the bottle; it is often important, and always harmless. Do not leave the bottle uncorked longer than necessary, for volatile substances escape, and others grow more concentrated by evaporation.

Medicines should be kept in a dry, cool, and dark closet. Dampness impairs the activity of most drugs, and many are decomposed by light or heat. Only a few should be kept on hand, each in small quantity—as they do not, as a rule, keep well—and of the best quality. It is poor economy to buy drugs where they are the cheapest, as they are almost sure to be adulterated. Get them from a reliable apothecary. What is left of a prescription whose use is permanently discontinued should be thrown away, as it is highly improbable that the same combination will ever be called for again, and most of them undergo changes in character by age, so that to keep them only complicates the contents of the medicine-chest, and increases the liability to error. Liniments, and all preparations for external use, should be kept in a corner by themselves, and labeled *poison*. Medicines ought to be kept under lock and key. Especially is it important in a hospital ward not to leave dangerous drugs within reach of the patients. The ward medicine-chest should be systematically arranged, each bottle or box in its own place, so that there need be no delay in finding things called for.

The nurse's responsibility in the matter of medicines consists in the prompt, accurate, and intelligent administration of such as are prescribed by the physician. Only in cases of unusual emergency, and where medical advice is unattainable, should you ever assume anything beyond this. You will be constantly asked, by people who consider a nurse as "next thing to a doctor," and who do not realize that here is the most rigid line of demarkation between them, to recommend something for this or that trouble. Do not permit yourself to yield to the temptation to tell what you have seen used in similar cases, for you can not be sure that the cases were exactly similar. Remember that a well-disciplined nurse never makes a diagnosis, and never prescribes. But you should know the effects that the remedies which you give are intended to produce, and when their continuation is contra-indicated. It is well to familiarize yourself with the ordinary doses of medicines in common use, and with the symptoms of overdosing.

The susceptibility to the action of drugs varies in different individuals, and is much modified by habit. This is especially true of narcotics. Custom produces tolerance and diminished impressibility, so that after a time increased quantities are required to produce the same effect. There is great danger of becoming dependent upon their use. The habit—pre-eminently that of opium—is so easily acquired, so difficult to overcome, and followed by such a train of disastrous consequences, that the greatest care should be taken to avoid it. Narcotics ought *never* to be used except under the direction of a physician. After giving a narcotic, the patient should be kept undisturbed until it takes effect.

If a medicine ordered in gradually increasing doses is for a time discontinued, the acquired tolerance may be lost, and, upon recommencing, there must be a return to the smallest dose, or too powerful effects may follow.

Some drugs, notably digitalis, have, on the contrary, a cumulative action, seeming at first inert, but after a few doses acting suddenly and with great energy, having apparently the effect of the several doses combined. Such are given in gradually decreasing, rather than increasing, doses.

The exact results of a given dose can not always be foreseen. It occasionally happens that individual idiosyncrasies interfere with the action of medicinal agents, and even render injurious those usually salutary. Thus opium sometimes excites instead of quieting, and the smallest quantity of mercury will salivate a susceptible constitution. Every unusual or inordinate action of a drug should be reported to the physician, and its use suspended until further directions are received.

Peculiar effects sometimes depend upon the imagination, for which reason it is better that the patient should not always know what he is taking. His medicine should be brought to him at the proper time, ready to take, without thought on his part, or previous discussion. Regularity and promptness in its administration are important. Do not fancy that half an hour more or less will make no difference, or harbor the absurd notion that if by an accident the dose should be omitted at one hour the error can be rectified by doubling it the next time.

If there are no special orders given, allow an interval of half an hour between medicine and food. Most drugs act more powerfully on an empty stomach, and some are too irritating to be borne. Arsenic, iron, and cod-liver oil are always given after eating. If medicines are ordered just before meals, care must be taken that the diet is not such as to be incompatible. Milk, taken too near a dose of quinine in solution, or any acid, may be coagulated and rejected. The activity of iodine will be impaired by starchy food.

The spoon or glass in which medicine is given should be washed each time immediately after use. Iron and the mineral acids should be taken through a glass tube, to prevent injury to the teeth. A separate glass should be kept for oily and strong-smelling medicines. Disagreeable tastes may be, to some extent, lessened by holding the nose while swallowing. A bit of bread is better than anything else to remove lingering traces of the flavor. Licorice and dried orange-peel are recommended, but better than anything to take after medicine is some pungent flavor beforehand, as a little brandy, essence of peppermint, or wintergreen, which will blunt the sensibility of the nerves of taste. Oil may be given in brandy, strong coffee, lemon-juice, or in the froth of beer. Pour the dose carefully in the center, so that it will nowhere touch the glass, and it can be easily swallowed. For a child, shake it in a bottle with hot milk, sweeten, and flavor with cinnamon, or stir it into a cup of hot broth Nearly tasteless emulsions can be procured of both castor and cod-liver oil.

Children are peculiarly sensitive to the action of drugs, and usually call for but small quantities. A rule given for the administration of medicine to a child under twelve years is: Add 12 to the child's age. The dose to be given to the child is in the same proportion to the adult dose as is the child's age to the sum so produced. For instance, if the child be two years old, $2 + 12 = 14$, $2 = \frac{1}{7}$ of 14. Give $\frac{1}{7}$ the adult dose. If the child is six, $6 + 12 = 18$, $6 = \frac{1}{3}$ of 18. Give $\frac{1}{3}$ the adult dose. There are some exceptions to this rule, as calomel and castor-oil, which need only be reduced about one half for a child.

It sometimes becomes necessary, in the case of a child or a delirious person, to administer medicine by force. To do this, compress the nostrils so that the mouth will have to be opened in breathing. The medicine can then be carried in a spoon far back in the mouth and poured slowly down the throat, when it must of necessity be swallowed. Force should only be resorted to when all other means fail, as the excitement which it occasions is always injurious. Persuasion accomplishes much with children, and even an apparently insensible patient may often be induced to swallow if you first attract his attention by gently rubbing his lips with the spoon.

Medicines should be measured in a graduated glass, or doses of less than a drachm in a minim-tube, both of which can be procured at any drug-store. Spoons are of very variable capacity, and drops differ with the consistence of the fluid and the shape of the edge over which they are poured, so that they can be with the greatest care only approximate measures. A minim, the smallest accurate liquid measure, is equivalent to about one drop of an aqueous solution, but it makes three or four of chloroform. The minim of any tincture is usually two drops, of a fluid extract but one.

APOTHECARIES' MEASURES.	FLUID MEASURES.
gr. xx = ℈j;	♏lx = fʒj;
℈iij = ʒj;	fʒviij = f℥j;
ʒviij = ℥j;	f℥xvj = Oj;
℥xij = lbj.	Oviij = Cj.

APPROXIMATE MEASURES.

1 teaspoon (holding 45 drops of pure water)	= about	ʒj;
1 tablespoon	" "	℥ss;
1 wineglass	" "	℥ij;
1 tea-cup	" "	℥iv;
1 coffee-cup	" "	℥viij.

The gramme (gm.) of the French metric system equals about 15 grains. The cubic centimetre (C. c.) equals about 16 minims. The litre equals about 2 pints.

The metric system is of growing popularity, owing to the simplicity of its decimal character, and is now very generally used. The gramme is the unit of weight; the Latin prefixes, deci, centi, milli, etc., are used to indicate its subdivisions, and the Greek, myria, kilo, hecto, deka, etc., its multiples, always on the scale of ten. In place of the decimal point, a vertical line is sometimes used, at the right or left of which the numbers are written, as:

myriagramme,	10,000	
kilogramme,	1,000	
hectogramme,	100	
dekagramme,	10	
gramme,	1	
decigramme,		1
centigramme,		01
milligramme,		001

The standard weights and measures should be thoroughly familiar to every nurse, and should be used in place of the ordinary unreliable measurements. It will be found an advantage to have also a ready comprehension of the symbols and abbreviations used in writing prescriptions. The numbers are expressed by Roman figures, and follow always the symbols to which they relate: as, ʒ j, ʒ iss., ℥ ij, gr. iij, ℈ iv, gtt. v, llb. vj, ♏ x, etc.

ABBREVIATIONS AND SYMBOLS.

ĀĀ., *ana*, of each.
Add., *adde*, add to it.
Ad. lib., *ad libitum*, as you please.
Alt. hor., *alternis horis*, every other hour.
Alt. noc., *alterâ nocte*, every other night.
Ante cib., *ante cibum*, before food.
Applic., *applicatur*, apply.
Aq. bull., *aqua bulliens*, boiling water.
Aq. dest., *aqua destillata*, distilled water.
Aq. marin., *aqua marina*, sea water.
Aq. pluvial., *aqua pluvialis*, rain water.
Aq. pur., *aqua pura*, pure water.
Bis die, or *bis die*.
Bis in d., *bis in dies*, twice a day.
Bull., *bulliat*, let it boil.
C., *congius*, a gallon.
Cap., *capiat*, let him take.
Cochleat., *cochleatim*, by spoonfuls.
Coch. amp., *cochlearum amplum*, a table-spoon.
Coch. med., *cochlearum medium*, a dessert-spoon.
Coch. parv., *cochlearum parvum*, a tea-spoon.
Comp., *compositus*, compound.
Conf., *confectio*, a confection.
Cort., *cortex*, bark.
Cuj., *cujus*, of which.
Decoct. hord., *decoctum hordei*, barley water.

Decub., *decubitus*, lying down.
Det., *detur*, let it be given.
Dil., *dilutus*, dilute.
Div. in p. æq., *dividatur in partes æquales*, divide into equal parts.
Drachm., *drachma*, a drachm.
Duo., *duo*, two.
Emp., *emplastrum*, a plaster.
Fot., *fotus*, a fomentation.
Freq., *frequenter*, frequently.
Fl. or f., *fluidus*, fluid.
Ft., *fiat*, let there be made.
Garg., *gargarisma*, a gargle.
Gossyp., *gossypium*, cotton wool.
Gr., *granum or grana*, a grain, or grains.
Gtt., *gutta or guttæ*, a drop, or drops.
Guttat., *guttatim*, by drops.
Hirud., *hirudines*, leeches.
Hor. decub., *hora decubitûs*, at bedtime.
Ind., *in dies*, daily.
Inf., *infusum*, an infusion.
Inject., *injectio*, an injection.
Lat. dol., *lateri dolenti*, to the affected side.
Lb., *libra*, a pound.
Lib. or llb., *libræ*, pounds.
Lim., *limones*, lemons.
Liq., *liquor*.
Lot., *lotio*, a lotion.
M., *misce*, mix.
Man, *manipulus*, a handful.
Mist., *mistura*, a mixture.
N., *nocte*, at night.
No., *numero*, in number.
O., *octarius*, a pint.
Ol., *oleum*, oil.
Ov., *ovum*, an egg.
P. or pug., *pugillus*, a pinch.
Pil., *pilula*, a pill.
P. R. N., *pro re natâ*, as occasion arises.
Pulv., *pulvis*, a powder.
Q. P., *quantum placet*, as much as you please.
Q. S., *quantum sufficit*, as much as is sufficient.
Quotid., *quotidie*, every day.
℞., *recipe*, take.
Rad., *radix*, root.
S. or Sig., *signa*, write.
Sem., *semen*, seed.
SS. or s., *semissis*, a half.
Sum., *sumendus*, to be taken.
S. V. G., *spiritus vini gallici*, brandy.
S. V. R., *spiritus vini rectificatus*, alcohol.
Syr., *syrupus*, sirup.
T., *ter*, three times.
T. d. or *ter die*.
T. i. d., *ter in dies*, three times a day.
Tr., *tinctura*, tincture.
Troch., *trochisci*, lozenges.
Ung., *unguentum*, ointment.
♏, *minimum*, a minim.
ʒ, *drachma*, a drachm.
℥, *uncia*, an ounce.
℈, *scrupulum*, a scruple.
2 dis., every two hours.
3 tiis., every three hours.
4 tis., every four hours.
6 tis., every six hours.

LIST OF DRUGS IN COMMON USE.

NAME.	Dose internally.	Effects to be looked for.	REMARKS.
ACONITE.		General sedative.	A powerful poison, to be used with great care. The preparations for external use should not be applied to an abraded surface, or to any part of the mucous membrane.
Ext. of leaves.	Gr. $\frac{1}{6}$–j.	Lowered pulse, respiration and temperature.	
Tr. of root.	♏ j–v.	Increased action of skin and kidneys.	
Fleming's tinct.	♏ ss.–ij.	Irritation of fauces, tingling and numbness of extremities, muscular weakness.	
Aconitia.	Gr. $\frac{1}{200}$–$\frac{1}{100}$.		
ALCOHOL.		Diminished excretions. In small dose, general stimulation, with slight rise of temperature. In large dose, reduces fever. Excitement followed by narcotism.	The most powerful cardiac stimulant known. Rarely given pure. Effects much modified by habit.
Brandy, Whiskey, etc.	ʒ j +		
ALUM.	Gr. x–xx.	Astringent or emetic.	Coagulates albumen; most used locally.
AMMONIA.		Stimulant, antacid.	Volatile and of variable quality. Should be kept under a glass stopper, as it rapidly erodes cork.
Aqua.	♏ v–xxx.		
Aromatic spirits.	ʒ ss. – ʒ ij.		
Solut. of acetate.	ʒ j – ℥ ss.	Diaphoretic and antipyretic.	*Spirits of Mindererus.*
Carbonate.	Gr. iij–x.	Expectorant.	*Common Smelling Salts.*
Valerianate.	Gr. j–vj.	Nerve sedative.	
ANISE.	Gr. x–xxx.	Carminative.	
ANTIMONY.		Alterative or emetic. Promotes all the secretions.	Mineral poison, in overdose inducing extreme prostration. Externally an irritant.
James's powder.	Gr. ij–x.		
Tartar emetic.	Gr. $\frac{1}{32}$–iij.		
Wine.	♏ v– ʒ j.		
ARNICA.		Stimulating.	Most used externally as an application to bruises.
Tincture.	♏ v–xxx.		

ARSENIC.		Antiperiodic, alterative, and tonic. Improves nutrition. In overdose a violent corrosive poison.	Especially used in skin affections. It should never be given on an empty stomach. Has occasionally a cumulative effect.
Fowler's solut'n.	♏ ij–x.		
Pearson's "	♏ ij–xx.		
Donovan's "	♏ ij–vj.		Contains mercury, and may salivate.
ASAFŒTIDA.	Gr. x in pill.	Antispasmodic and somewhat laxative.	Used in nervous complaints, and some forms of dyspepsia. Imparts a strongly alliaceous odor to all the secretions.
Tincture.	ʒ ss. – ʒ ij.		
Mixture.	℥ ss. – ℥ j.		
ATROPIA.	Gr. $\frac{1}{120}$ – $\frac{1}{60}$.	See Belladonna.	Active principle of belladonna.
BELLADONNA.	Gr. j–iij.	Narcotic. Stimulates respiration, increases cardiac and peristaltic action. Dilates the pupils of the eyes. Dries the mucous membrane, and arrests secretion of milk. In large dose may occasion an eruption on the skin, dimness of vision, and delirium.	The physiological antagonist of opium. Used externally in the form of a liniment, unguent, or plaster.
Tincture.	♏ v–xx.		
Ext. of root.	♏ ij–iv.		
BENZOIN.	Gr. x–xx.	Expectorant and antiseptic. Stimulates the mucous membrane.	Used externally as an application to ulcers, etc.
Tincture.	♏ xv– ʒ j.		
Comp. Tinct.	♏ xv– ʒ j.		
BISMUTH.		Checks nausea and relieves dyspepsia arising from over-acidity of the stomach.	
Subnitrate.	Gr. v–xxx.		
Subcarbonate.	Gr. v–xxx.		
BROMIDES.		Sedative, lessening the amount of blood sent to the brain, and quieting the nervous system.	Incompatible with acids. Often combined with chloral. Too prolonged use may induce a form of chronic poisoning — bromism — manifested by physical and mental weakness, anæmia, and eruption of acne.
of potassium.	Gr. viij–lx.		
sodium.	Gr. viij–xxx.		
ammonium.	Gr. v–xxx.		
CALOMEL.		See Mercury.	

LIST OF DRUGS IN COMMON USE—(*Continued*).

NAME.	Dose internally.	Effects to be looked for.	REMARKS.
CAMPHOR.		Stimulant, antispasmodic and diaphoretic, and anodyne. May occasion dysuria, but will relieve the strangury produced by cantharides.	In large dose a narcotic poison.
Aqua.	℥ ss.–℥ j.		
Spirits.	♏ v–xxx.		Contains camphor ʒ ij to alcohol Oj; will be precipitated by water.
CANNABIS INDICA.	Gr. ss.–ij +	Resembles opium in action, but does not, like it, diminish the appetite or check the secretions. Is less certain in effect.	*Indian Hemp*, or *Haschish*. The extract is of variable strength.
CARBOLIC ACID.	Gr. ss.–ij.	Among the symptoms of overuse are nausea, faintness, heart failure, and a greenish shade in the urine, evident after standing for a time.	Most used externally as an antiseptic. Caustic when pure.
CASTOR OIL.	℥ ss.–℥ iss.	Cathartic.	Especially good for children and the puerperal state.
CHAMOMILE.		Aromatic tonic.	
Infusion.	℥ j–℥ ij.		To be made with cold water.
Oil.	♏ ij–x.		
CHLORAL HYDRATE.	Gr. x–xl.	Hypnotic and antispasmodic.	Does not relieve pain except in dangerous doses.
CHLORODYNE.	♏ x–xxx.	Anodyne.	Compounded of several powerful narcotics.

Chloroform.	♏ v–xxx.	Anæsthetic. Relaxes the muscular system and has a powerfully sedative effect upon the heart.	Chiefly given by inhalation. See p. 201.
Spirits of.	ʒ ss. – ʒ j.	Anodyne and antispasmodic.	
Cinchona.	Gr. x–xl.	Antiperiodic, tonic and antipyretic.	*Peruvian Bark.*
Cinchonidia.	Gr. iij–xxx.		"Cinchonism" is manifested by ringing in the ears, deafness, fullness of the head, trembling, and cardiac excitement.
Quinia.	Gr. j–xxx.		
Quinidia.	Gr. j–xxx.		
Cod-Liver Oil.	ʒ j – ℥ ss.	Nutritive and tonic.	
Conium.		Sedative, relaxing muscular system; in overdose paralyzing.	*Hemlock.* Effects increased by combination with opium.
Extr. of leaves.	Gr. ij–viij.		
Tincture.	♏ vj – ʒ j.		
Extract of seed.	♏ iij–v.		
Copper.			
Sulphate.	Gr. $\frac{1}{8}$–$\frac{1}{4}$.	As a tonic.	Irritant poison. Externally escharotic.
	Gr. iij–vj.	As an emetic.	
Corros. Sublimate.		See Mercury.	
Croton Oil.	Gtt. $\frac{1}{4}$–ij.	Violent cathartic.	Externally, vesicant.
Digitalis.		Sedative, diuretic. In small dose, reduces the number of pulse-beats while increasing their force. In toxic dose, causes nausea, faintness, fall of temperature, and irregularity of the heart.	Cumulative in effect.
Fluid extract.	♏ j–v.		Marked intermittence of pulse indicates immediate discontinuance.
Infusion.	ʒ ij – ʒ iv.		
Tincture.	♏ v – ʒ i.		
Digitaline.	Gr. $\frac{1}{60}$ – $\frac{1}{30}$.		
Donovan's Solution.		See Arsenic.	
Dover's Powder.		See Opium.	

LIST OF DRUGS IN COMMON USE—(*Continued*).

NAME.	Dose internally.	Effects to be looked for.	REMARKS.
ELATERIUM.	Gr. $\frac{1}{32}-\frac{1}{10}$.	Strong cathartic and hydragogue.	
EPSOM SALT.		See Magnesia.	
ERGOT.		Checks hæmorrhage; excites uterine contractions.	
Fluid Extract.	ʒ ss. – ʒ j.		
ETHER.		Antispasmodic, anæsthetic.	
Sulphuric.	♏ x–xxx.		Chiefly given by inhalation.
Compound Spts.		Stimulant and anodyne.	*Hoffmann's Anodyne.*
Spts. of Nitrous Ether.	ʒ ss. – ʒ j.	Diuretic, diaphoretic, and carminative.	*Sweet Spirits of Nitre.* Becomes strongly acid with age.
FOWLER'S SOL.		See Arsenic.	
GALLIC ACID.	Gr. v–xx.	Astringent.	Used to control hæmorrhages.
GINGER.		Carminative and stimulant.	
Tincture.	ʒ ss. – ʒ j.		
GLAUBER'S SALTS.		See Soda.	
GREY POWDER.		See Mercury.	
HIVE SYRUP.		See Squill.	
HOFFMAN'S ANODYNE.		See Ether.	
HYDROCHLORIC ACID.		See Muriatic Acid.	
HYDROCYANIC ACID.		See Prussic Acid.	

HYOSCYAMUS.		Narcotic.	Allied to Belladonna. More hypnotic, but less efficacious against pain. Non-constipating.
Extract.	Gr. j–iij.		
Tincture.	♏ xv – ʒ j.		
Hyoscyamia.	Gr. $\frac{1}{90}$ – $\frac{1}{20}$.		
HYPOPHOSPHITES of lime, soda, etc.	Gr. iij–xv.	Nerve tonics.	
IODINE.		Alterative, stimulating the absorbent and glandular systems.	Symptoms of *iodism* are those of acute catarrh, with a saline taste in the mouth, and sometimes eruption of acne or ptyalism.
Tincture.	Gtt. ij–x.		Decomposed by water. Externally an irritant.
IODIDE OF POTASSIUM.		See Potassium.	
IODOFORM.	Gr. j–iij.	Antiseptic, stimulant, and locally anæsthetic. In overdose, nausea, diarrhœa, heart failure, dusky urine, convulsions, or nervous derangement.	Externally used as a dressing for wounds, etc. Contains 29 parts in 30 of iodine, but has none of its irritant action.
IPECACUANHA.	Gr. $\frac{1}{4}$–j.	As an expectorant and diaphoretic.	In small dose, checks vomiting; in large dose, excites it.
	Gr. v–xx.	As an emetic.	
Syrup.	ʒ ss. – ʒ iv.		
Wine.	♏ xv – ʒ j.		
Co. powder.		See Opium.	
IRON.		Tonic; astringent. Increases number of red corpuscles in blood.	Should be taken after meals through a tube. Use needs to be long continued to be effective.
Dialyzed.	♏ x–xl.		The only preparation which is non-irritating, non-constipating, and does not blacken the teeth.

LIST OF DRUGS IN COMMON USE (*Continued*).

NAME.	Dose internally.	Effects to be looked for.	Remarks.
IRON (*cont.*).			
Tr. of chloride.	♏ v–xxx.		
Subsulphate.			Styptic. *Monsel's solution.*
Syr. of iodide.	♏ xv–xl.		
JALAP.	Gr. viij–xxx.	Hydragogue cathartic.	
JAMES'S POWDER.		See Antimony.	
LAUDANUM.		See Opium.	
LEAD.			
Acetate of.	Gr. j–iij.	Astringent.	*Sugar of lead.* Often given in combination with opium. Symptoms of *plumbism* (chronic lead poisoning) are loss of appetite, colic, constipation, a bluish line along the teeth, failure of strength, impaired sensibility, paralysis.
LIME-WATER.	℥ ss.–℥ ij.	Antacid and astringent.	To prepare, put an ounce of fresh lime in a quart bottle. Shake with a little cold water. Fill the bottle and keep well corked.
LICORICE POWDER.		See Senna.	
MAGNESIA.		Antacid.	
Carbonate.	ʒ ss.–ʒ ij.	Laxative.	
Sulphate.	ʒ j–iv.	Cathartic.	*Epsom salt.*
Liquid citrate.	℥ v–x.	Cathartic.	

MERCURY.		Alterative, increasing glandular activity. In large dose, salivation, soreness of gums and teeth, foul breath, nausea, diarrhœa, muscular pains, and nervous phenomena.	Used externally in numerous forms, the constitutional effects always to be looked out for. Cathartics containing mercury, if not promptly effective, should be followed by some other purgative, to remove it from the system.
Bichloride.	Gr. $\frac{1}{30}-\frac{1}{4}$.	In overdose, violent poison.	*Corrosive sublimate*; most used externally as an antiseptic.
Mild bichloride.	Gr. $\frac{1}{12}-\frac{1}{4}$.	As an anti-emetic or alterative.	*Calomel.*
	Gr. v–x.	As a purgative.	
M. with chalk.	Gr. ss.–xx.	Alterative or purgative.	*Gray powder.*
Blue pill.	Gr. j–xv.	Purgative.	
MORPHIA.		See Opium.	Alkaloid of opium.
MURIATIC ACID.		Aids digestion and increases the secretions of the mucous membrane.	Of all the mineral acids, only the *dilute* forms are used medicinally.
Dilute.	Gtt. v–xxx.		
NITRIC ACID.	Gtt. ij–xx.	Similar to muriatic.	They should be taken through a tube, and the mouth afterwards rinsed with a weak alkaline solution, as of soda bi-carbonate.
Dilute.			
NITRO-MURIAT. AC.	Gtt. ij–xx.	Similar to muriatic.	
NUX VOMICA.		Tonic, affecting especially the nervous system. Laxative and somewhat diuretic. In overdose produces convulsions resembling those of tetanus, and death.	Sometimes has a cumulative effect.
Extract.	Gr. j–iij.		
Tincture.	Gtt. v–xx.		
STRYCHNIA.	Gr. $\frac{1}{60}-\frac{1}{12}$.		
OPIUM.	Full dose, gr. j.	Narcotic. Lowers rate of pulse and respiration; checks all the secretions except that of the skin, which it excites abnormally. Contracts the pupils of the eyes, subdues pain, and induces sleep.	Children are peculiarly sensitive to its action, being sometimes seriously affected even by its external use.

LIST OF DRUGS IN COMMON USE—*Continued.*

NAME.	DOSE (usually).	EFFECTS OR USED FOR	REMARKS.
OPIUM (*cont.*)			
Tincture.	♏ v–xxv.		*Laudanum.*
Acetated Tinct.	♏ v–xx.		
Camphorated T.	ʒ ss.–ʒ j.		*Paregoric.*
Compound Tinc.	♏ xx–xl.		*Squibb's Cholera Mixture.*
Deodorized T.	♏ v–xxv.		*McMunn's Elixir.*
Vinegar.	♏ v–x.		*Black Drop.*
Wine.	♏ v–xx.		
Confection.	Gr. viij–xl.		
Dover's powder.	Gr. x.		*Comp. powder of ipecac.* Each powder of gr. x, contains 1 grain each of opium and ipecac, and eight of sulphate of potassium.
Liquid Dover's powder.	♏ x.		
Morphia.			One sixth of a grain of morphia is equivalent to one grain of opium. The U. S. solution contains 1 grain to the fluidounce, Magendie's, 16 grains. The latter is most used hypodermically.
U. S. solution of sulphate.	ʒ j–ʒ ij.		
Magendie's solution.	♏ v–x.		
OXALIC ACID.	Gr. ½–j.	Cooling and slightly sedative.	
PEPPERMINT.	ʒ ½–ʒ j.	Carminative and stimulant.	
PANCREATINE.	Gr. v–xv.	Digestive.	
PEPSIN.	Gr. v–xv.	Digestive.	
PERUVIAN BARK.		See Cinchona.	
PHOSPHORIC ACID.	♏ x–xl.	Tonic and refrigerant.	After meals (see Muriatic).

POTASSIUM.			*Potash*, with lime, constitutes *Vienna caustic.*
Acetate.	Gr. x–l.	Diuretic and laxative.	
Bromide.		See Bromides.	
Carbonate.	Gr. x–xxx.	Antacid, diuretic.	
Chlorate.	Gr. x–xxx.	Allays inflammation of mouth and throat.	The saturated solution is commonly used as a gargle.
Iodide.	Gr. ij–xx.	Alterative. May give symptoms of iodism, which see.	
Nitrate.	Gr. x–xv.	Diaphoretic, diuretic, and sedative.	*Nitre, Saltpetre.*
Permanganate.	Gr. ¼–j.	Disinfectant and deodorizing.	*Condy's Fluid* is a solution of the permanganate.
PRUSSIC ACID.		Antispasmodic and sedative. In overdose, a deadly poison.	
Dilute.	♏ j–iv.		Contains two per cent of the strong acid.
QUININE.		See Cinchona.	
RHUBARB.	Gr. v–xx.	Laxative.	Gives a yellow color to all the secretions.
Sirup.	ʒ ij–iv.		
Tincture.	℥ ss. – ℥ j.		
ROCHELLE SALT.	ʒ j–v.	Laxative.	*Tartrate of potash and soda.*
SALICYLIC ACID.	Gr. v–l.	Antipyretic, antiperiodic, and externally antiseptic.	
SEIDLITZ POWDERS.	One of each kind.	Laxative.	The blue paper contains Rochelle salt and bicarbonate of soda, the white, tartaric acid. Dissolve each separately, and pour the larger into the smaller. Brisk effervescence should ensue. Lemon juice and sugar will improve the taste. The powders need to be kept dry.
SENNA.	ʒ ss. – ʒ ij.	Cathartic.	Prompt and safe, but apt to occasion griping.
Infusion.	℥ iv.		

LIST OF DRUGS IN COMMON USE—(*Concluded*).

NAME.	Dose internally.	Effects to be looked for.	REMARKS.
SENNA (*cont.*)			
Comp. licorice powder.	ʒ j – ʒ iv.		
SILVER.		Tonic and astringent.	
Nitrate.	Gr. $\frac{1}{4}$–j.	Produces discoloration of the tissues, beginning inside the mouth.	Action antagonized by salt.
Fused nitrate.			*Lunar caustic.*
SODA.			
Bicarbonate.	Gr. v–lx.	Antacid.	
Chloride.	℥ ss. – ℥ ij.	Emetic.	*Common salt.*
Sulphate.	℥ ij – ℥ j.	Cathartic.	*Glauber's salt.* All the saline cathartics are best taken before breakfast. They must be thoroughly dissolved.
SPIRITS OF MINDERERUS.		See Ammonia.	
SQUILL.	Gr. j–iij.	Expectorant, diuretic.	
Syrup.	ʒ $\frac{1}{4}$ – ʒ j.		
Comp. syrup.	ʒ $\frac{1}{8}$ – ʒ j.	Emetic.	*Hive Syrup.* Contains antimony, gr. j – f ℥, and is dangerous to use unadvisedly.
STRAMONIUM.		Narcotic, similar to belladonna in action.	The dry leaves are sometimes rolled into cigarettes, and smoked for the relief of asthma.
Ext. of leaves.	Gr. $\frac{1}{4}$–gr. j.		
Tincture.	ℳ x–xx.		
STRYCHNIA.		See Nux Vomica.	
SULPHUR.	ʒ ss. – ʒ ij.	Alterative, antiseptic.	

SULPHURIC ACID. Dilute.	Gtt. x–xxx.	See Muriatic Acid.	
SWEET SPIRITS OF NITRE.		See Ether.	
TANNIC ACID.	Gr. ij–x.	Astringent.	Used to check hæmorrhages and mucous discharges.
TARTAR EMETIC.		See Antimony.	
TURPENTINE. Oil or Spirits of.	♏ v – ℥ ij.	Stimulates skin and kidneys, arrests hæmorrhages of mucous membrane, relieves the tympanites of typhoid. May induce strangury.	A small dose may be given on sugar; a large one, suspended in the yolk of an egg. Externally counter-irritant.
VALERIAN. Tincture.	ʒ j – ʒ iij.	Nerve sedative, not narcotic.	
ZINC. Oxide of.	Gr. j–viij.	Astringent and tonic.	Most used externally.
Sulphate of.	Gr. ss.–xxx.	Full dose a prompt emetic.	*White vitriol.*

CHAPTER VIII.

Groups of food material—The process of digestion—Preparing and serving food—Feeding helpless patients—Water and ice—Milk—Animal broths—Gruels, etc.—Receipts.

ALL animal bodies are made up of the four elements, oxygen, hydrogen, nitrogen, and carbon, together with a small quantity of mineral matter. Oxygen and hydrogen, in combination, form water, which enters into all constituent parts of the body, amounting to more than two thirds of its entire weight. Life is maintained by a continual process of oxidation, or combustion, producing heat and energy. To supply material for such production of vital force, and also to build up and repair the waste of the tissues carrying on the work, food is required. Our food, in whatever form we take it, is composed of some or all of the four elements above named, in variously proportioned compounds.

The hydrocarbonaceous compounds, of which starch, sugar, fat, and gum, are the most familiar and most important, furnish the materials for oxidation, whatever surplus may be taken into the system being stored as fat. These may be called the heat-producers.

Nitrogenous compounds are more especially flesh-formers, and go to repair the waste of the body. The most important of them is albumen, and the entire group of related compounds, including fibrin, casein, gluten, gelatine, etc., are, from their resemblance to it, frequently termed albuminoids.

Neither group has exclusively the one function, for, in the transformation of albuminoids into living tissue, some heat is produced; and in all healthy tissue there must be present, also, a certain proportion of the hydrocarbons. But the division is still of great value, forming the basis of all scientific dietetics.

In addition to these two great groups of food-matter certain earthy salts are required—phosphorus for the nervous system, iron for the blood, lime for the bones, potash and soda for the muscles, etc. These we take insensibly, they being more or less in nearly everything we eat and drink. Common salt (chloride of sodium) is the only one which we make a practice of adding to our food.

Hydrogen and carbon very readily unite with oxygen; it is a peculiarity of nitrogen, on the contrary, that it interferes with oxidization. Entering into the composition of the bodily tissues, it protects them, so that they are not rapidly consumed by the heat of the oxidizing hydrocarbons. Their destruction is generally slow, and the amount of nitrogenous matter needed for repair is much less than the amount of hydrocarbons called for as fuel. In a healthy diet—that is, one in which the supply corresponds to the demand—the heat-producers should be more abundant than the albuminoids. In growing children and in convalescents, where disease has caused undue waste of substance, the demand for albuminoids is greater.

Even in health it is well to know something of the constituents of our food, and what purpose each serves in the economy of nature; and, when sickness and its effects upon digestion and nutrition are to be taken into account, it becomes worthy of the most serious consideration. The original meaning of *nurse* was to nourish, and, in spite of all the secondary meanings that it has acquired, the question of nourishment still remains one of primary importance. What food to give, when and how to give it, are constantly recurring problems of the sick-room.

What kind of food is to be given in each case will usually be decided by the physician; how best to prepare and administer it are matters for the nurse to know. Everything should be the best of its kind, well cooked, palatably seasoned, and attractively served. Consult, as far as possible, the known tastes of the patient; but do not each time ask him what he would like. Something unexpected will often be acceptable, when to have thought about it beforehand would have taken away all appetite for it. His food should never be prepared in his presence, nor the smell of cooking be allowed to reach him, if it is possible to avoid it. Your own meals should never be served in the sick-room; it is equally bad for nurse and patient. Serve everything as nicely as may be, always with a clean napkin, spotless china, shining silver and glass. Have the dishes dry on the outside, taking particular care that nothing gets spilled from the cup into the saucer. This point needs special emphasis.

Have hot things very hot, and cold ones really cold. More salt and less sugar will generally be wanted than in health. Highly seasoned food is not good or often wished for, but everything should be agreeably flavored and of good quality: eggs above suspicion, milk always sweet, and butter fresh. The two articles last named ought always to be kept cool and closely covered, for they absorb the odors of whatever is near them. The least taint in any kind of food should lead to its rejection, and the substitution of something else. Before taking food to the sick, you should always taste it to be sure that it is just right, but on no account taste it in his presence, or with his spoon. Whatever is not eaten should be at once taken away, as to leave it in sight, in the hope that he will want it a little later, is worse than useless. It is always better to bring too little rather than too much.

A weak digestion can not manage a load, but must take little and correspondingly often. It is not wise to overburden the patient's stomach in your anxiety to make him take plenty of nourishment, for it is not what is swallowed, but what is digested, that does him good. When only a very small quantity can be retained, it should be in a highly concentrated form. Where there is nausea and diarrhœa, give but little at a time, and always cold.

Ascertain from the doctor how much he wishes the patient to take within the twenty-four hours, and, dividing it up into suitable quantities, give it at regular intervals. The importance of regularity can hardly be too much emphasized. If given punctually at fixed hours, a habit not only of taking, but of digesting it, will soon be acquired, for our most automatic functions are influenced by custom. Each time a patient is fed, a note should be made of the kind and approximate quantity of nourishment taken. Only in exceptional cases should he be roused from sleep for food, but a supply should be provided for use during the night, as it may be most important to have it at hand. Put it in the coolest place, and cover to keep out the dust. Some light nourishment the last thing at night will often help to send the patient to sleep.

In feeding a helpless patient, give the food slowly and in manageable quantities, letting each morsel be fairly swallowed before another is given. If there is difficulty in making him swallow, it will be lessened by taking advantage of his inspirations. See that the head is not turned to either side—even a slight inclination may cause the liquid to run out at the corner of the mouth instead of down the throat—have the clothes well protected, and take pains not to make an external application of it. A feeding-cup with a spout may be used, but, unless the patient is able to control it himself, it has the disadvantage that the nurse can not see how fast she is pouring its contents. Fluid food can in most cases be taken more conveniently by suction through a bent glass tube, and patients will often take a larger quantity in this way than they can be induced to in any other. After feeding, always dry the mouth, especially at the corners, if the patient can not well do it for himself. The lips not infrequently become sore from want of this little care.

With fever, there is often great thirst. Usually it will be quite safe to allow the patient all the water he wants. If not, it is worthy of note that a small glass *full* will be much more satisfactory, especially to children, than the same quantity in a larger vessel. Slightly bitter or acidulated drinks slake thirst more effectually than water alone. Bits of ice are often very refreshing, and always harmless. They may be easily split off with a pin, in the direction of the grain. Small bits swallowed whole are excellent to control nausea. Ice, to keep well, must be so placed that the water will drain off as fast as it melts. Small pieces may be kept in a glass for some time by suspending them in flannel, in which one or two holes are snipped for the water to run through. Confine it by an elastic band about the edge of the glass. A metal spoon in the glass helps to melt the ice by conducting away the heat rapidly. A newspaper wrapped around the ice-pitcher, being, on the contrary, a very bad conductor, will help to preserve it. Ice, to be taken internally, must be clean, and that not only on the outside. It is a great mistake to think that all deleterious substances are disengaged from it in freezing. It is as necessary to have good ice as pure water, which is of recognized importance. Pure water should be transparent, sparkling, colorless, and odorless, though these characteristics do not prove it such.

To provide food for the sick which will be at once suitable and acceptable is a matter which requires care, judgment, and ingenuity, but it is well worth the expenditure of them all. The aim should be to give what will be at once easy of digestion and of value after it is digested.

Digestion is an elaborate and complex process, including both mechanical and chemical action. The saliva contains a peculiar ferment called ptyalin, which has the property of converting starch into sugar. The gastric secretion acts in a similar way upon the albuminoids, changing them into soluble peptones. The bile, the secretion of the liver, has the power of emulsionizing fats, and the pancreatic and intestinal juices supplement to a certain extent the action of all the three. Whatever portion of the food resists the action of all these solvents is rejected from the system as waste matter, while such as is reduced to a fit state of solution is absorbed into the circulation. When the gastric secretion is defective, pepsin may be given, with an acid, to aid in the solution of albuminoids; pancreatine, preferably with an alkali, assists in the intestinal digestion.

Liquid food is the most easily digested, and in severe illness may be entirely relied upon. Meat contains a great deal of nutriment in a small bulk, but is a good deal of a tax upon the digestive organs. Vegetables contain all the food elements, for, as is well known, life can be sustained on a purely vegetable diet, but they include a large proportion of waste in the shape of indigestible fibrous tissue. The leguminous plants are rich in albuminoids, the cereals and tubers in starch, although wheat contains a large amount of gluten. Fruits consist chiefly of water and sugar, with some vegetable acid, and have but little nutritive value. Milk is the only article of diet which contains in itself all the necessary elements of nutrition in their proper proportions. Tea and coffee are rather stimulant than nutrient. Cocoa and chocolate are more nutritious than either, but unfortunately are somewhat difficult of digestion. Eggs are of high nutritive value, but in them, and in most other animal foods, the albuminoids predominate. Beef ranks high among the animal foods, but the usefulness of beef-tea is very generally overestimated, as the albuminous and most nutritive portion of the meat is left behind in its preparation. It has value, but it is as a stimulant rather than as a food. Preparations of beef which has been peptonized, or partially digested outside of the body, are far superior to it. Beef-tea is, however, much used. It may be given either hot or ice-cold. Frozen beef-juice will sometimes be acceptable when it is not relished in the fluid form. Animal broths are made from beef, chicken, mutton, or veal. The latter is of the least value. Mutton is useful where it is readily digested, but there is frequent repugnance to it. A meat-tea, good by way of variety, is made by using equal quantities of beef, mutton, and veal. Meat from which the juice is to be extracted must always be put into cold water, and gradually heated. It may be allowed to simmer until the meat has quite lost its color, but should never reach the boiling-point. On the other hand, if the meat itself is to be eaten, it should be in the beginning exposed to a high temperature, which will coagulate the fibrin near the surface, and so prevent the escape of the juices.

All soups should be allowed to stand until cold, as the fat can not be perfectly removed while hot. Heat, when required for use, only to the palatable point, without further boiling. Any floating particles of fat that may still remain can be taken off by wiping over the surface with a piece of bread.

A variety of gruels, porridges, and panadas, are made of oatmeal, Indian-meal, arrow-root, rice-flour, corn-starch, etc. Different crushed cereals may be obtained already steam-cooked, which will be found excellent and very convenient, as they take little time for preparation. Directions for use are supplied with them.

Both oatmeal and Indian-meal have a loosening effect upon the bowels, and are consequently objectionable when there is any tendency to diarrhœa. In such cases boiled milk is preferable to raw. When there is nausea arising from over-acidity of the stomach, lime-water may be added to the milk, in any proportion up to one half. If there is also constipation, carbonic acid water, or Vichy, is to be preferred.

Milk may be kept for some time from souring, even in warm weather, by adding to each quart fifteen grains of bicarbonate of soda, and a little sugar.

Koumyss is a very nutritious and somewhat stimulant form of food. The original is prepared in Tartary from mare's or camel's milk; but an excellent imitation may be made by fermenting cow's milk. For directions, see receipt No. 23. This is very valuable, and will sometimes be assimilated when nothing else can be retained. Each quart is said to contain four ounces of solid food.

The following receipts for sick-cookery are all of tested value, and simple enough to be used successfully by the least experienced in culinary art.

FIFTY FORMS OF FLUID FOOD.

1. *Beef-tea, No. 1.*—Take a pound of juicy beef cut from the round, remove all the fat, and cut into very small pieces. Put in an earthen pot and add a quart of cold water. Cover it closely, let it soak for an hour, and then simmer gently for two hours more, or until the strength is quite extracted from the beef. Strain, and season with salt and pepper.

2. *Beef-tea, No. 2.*—Mince finely a pound of lean, juicy beef, from which all the fat has been removed; put into a wide-mouthed bottle or fruit-jar, just cover with cold water and cork tightly. Set the jar into a kettle of cold water, over a slow fire, and let it boil for three hours. Strain and season with salt.

3. *Raw Beef-tea.*—To half a pound of raw beef, free from fat, and finely minced, add ten grains of pepsin, and two drops of hydrochloric acid. Put in a large tumbler, and cover with cold water. Let it stand for two hours at a temperature of 90°, being frequently stirred. Strain and serve in a red glass, ice-cold. Peptonized food does not keep well, and should never be used more than twelve hours old.

4. *Beef Juice.*—Place half a pound of lean, juicy beef on a broiler over a clear hot fire, and heat it through. Press out the juice with a lemon-squeezer

into a hot cup, add salt, and serve hot with toast or crackers.

5. *Beef-tea with Oatmeal.*—Mix a tablespoonful of well-cooked oatmeal with two of boiling water. Add a cupful of strong beef-tea, and bring to the boiling point. Salt and pepper to taste, and serve with toast or crackers. Rice may be used in place of the oatmeal.

6. *White Celery Soup.*—To half a pint of strong beef-tea, add an equal quantity of boiled milk, slightly and evenly thickened with flour. Flavor with celery seeds, or pieces of celery, which are to be strained out before serving. Salt to taste.

7. *Chicken Broth.*—An old fowl will make a more nutritious broth than a young chicken. Skin, cut it up and break the bones with a mallet. Cover well with cold water, and boil slowly for three hours. Salt to taste. A little rice or tapioca may be boiled with it, if desired.

8. *Mutton Broth.*—Cut up fine two pounds of lean mutton, without fat or skin. Add a tablespoonful of barley, a quart of cold water, and a teaspoonful of salt. Let it boil slowly for two hours. If rice is used in place of the barley, it will not need to be put in till half an hour before the broth is done.

9. *Oyster Broth.*—Cut into small pieces a pint of oysters; put them into half a pint of cold water, and let them simmer gently for ten minutes over a slow fire. Skim, strain, add salt and pepper.

10. *Clam Broth.*—Take three large clams, and let them stand in boiling water till the shells begin to open. Drain out the liquor, add an equal quantity of boiling water, a teaspoonful of finely pulverized cracker crumbs, a little butter, and salt to taste.

11. *Rice Soup.*—Take half a pint of chicken stock,

and two tablespoonfuls of rice. Let them simmer together for two hours, then strain and add half a pint of boiling cream and salt to taste. Boil up once, and serve hot.

12. *Peptonized Milk.*—Stir up five grains of pancreatic extract, and fifteen of bicarbonate of soda, in a gill of water; mix thoroughly and add a pint of fresh milk. Put in a bottle or a covered jug, and let it stand where it will keep warm for an hour. Then put on ice until required for use, or boil for two or three minutes to stop further digestive action. Milk so prepared will have a faintly bitter flavor; it may be sweetened to taste, or used in punch, gruels, etc., like ordinary milk.

13. *Flour Gruel.*—Mix a tablespoonful of flour with milk enough to make a smooth paste, and stir it into a quart of boiling milk. Boil for half an hour, being careful not to let it burn. Salt and strain. This is good in cases of diarrhœa.

14. *Boiled-Flour Gruel.*—Moisten a pint of flour with a couple of ounces of cold water, make it into a ball, and tie it up tightly in a strong cloth. Slightly dampen the cloth, sprinkle it with flour, and boil it hard for ten hours. Then take off the cloth, and let the ball dry in a slow oven for ten hours more. Grate two teaspoonfuls of flour from the dry ball, mix it with cold water to a smooth paste, and stir it into half a pint of boiling milk. Simmer about three minutes, and sweeten. This is considered especially good for children while teething.

15. *Oatmeal Gruel.*—Boil a tablespoonful of oatmeal in a pint of water for three quarters of an hour, then put it through a strainer. If too thick, reduce with boiling water to the desired consistency. Season with salt.

16. *Oatmeal Gruel with Milk.*—Soak half a pint of oatmeal in a quart of water over night. In the morning add more water, if necessary, and boil for an hour. Squeeze through a fine strainer as much as you can, and blend it thoroughly with a pint of boiling milk. Boil the mixture for five minutes, and salt to taste.

17. *Cracker Gruel.*—Pour a pint of boiling milk over three tablespoonfuls of fine cracker-crumbs. Butter-crackers are the best to use. Add half a teaspoonful of salt, boil up once all together, and serve immediately. Do not sweeten.

18. *Indian-meal Gruel.*—Mix a scant tablespoonful of Indian-meal with a little cold water, and stir into a pint of boiling water. Boil for half an hour. Strain and season with salt. Sugar and cream may be added, if desired.

19. *Arrowroot.*—Mix a teaspoonful of Bermuda arrowroot with four of cold milk. Stir it slowly into half a pint of boiling milk, and let it simmer for five minutes. It must be stirred all the time, to prevent lumps and keep it from burning. Add half a teaspoonful of sugar, a pinch of salt, and one of cinnamon, if desired. In place of the cinnamon, half a teaspoonful of brandy may be used, or a dozen large raisins may be boiled in the milk. If the raisins are preferred, they should be stoned, and the sugar may be omitted.

Corn-starch or rice-flour gruel is made in the same way.

20. *Sago Milk.*—Wash a tablespoonful of pearl sago, and soak it over night in four of cold water. Put it in a double kettle, with a quart of milk, and boil till the sago is nearly dissolved. Sweeten to taste, and serve either hot or cold.

21. *Treacle Posset.*—Bring a cupful of milk to the

boiling-point, and stir into it a tablespoonful of molasses. Let it boil up well, strain, and serve.

22. *Milk and Albumen.*—Put into a clean quart bottle a pint of milk, the whites of two eggs, and a small pinch of salt. Cork, and shake hard for five minutes.

23. *Koumyss.*—Dissolve a third of a cake of compressed yeast (Fleischmann's), or its equivalent of fluid yeast, in a little warm—*not hot*—water. Take a quart of milk fresh from the cow, or warmed to about blood-heat, and add to it a tablespoonful of sugar, and the dissolved yeast. Put the mixture in beer bottles with patent stoppers, fill to the neck, and let them stand for twelve hours where you would put bread to rise, that is, at a temperature of 68° or 70°. Then put the bottles on ice, upside down, until wanted.

24. *Wine Whey.*—Heat half a pint of milk to the boiling-point, and pour into it a wine-glass of sherry. Stir once round the edge, and as soon as the curd separates, remove from the fire and strain. Sweeten if desired. The whey can be similarly separated by lemon juice, vinegar, or rennet. With rennet whey, use salt instead of sugar.

25. *Mulled Wine.*—Into half a cup of boiling water put two teaspoonfuls of broken stick cinnamon and half a dozen whole cloves. Let them steep for ten minutes, and then strain. Beat together until very light two eggs and two tablespoonfuls of sugar, and stir into the spiced water. Pour into this, from a height, a cupful of sweet wine, boiling hot. Pouring it several times from one pitcher to another will make it light and foamy. Serve hot. The wine should not be boiled in tin.

26. *Milk Punch.*—To half a pint of fresh cold milk,

add two teaspoonfuls of sugar and an ounce of brandy or sherry. Stir till the sugar is dissolved.

27. *Eggnogg.* — Beat the white of an egg stiffly, then stir into it in turn a tablespoonful of sugar, the yolk of the egg, a tablespoonful each of ice-water, milk, and wine. Do not beat, but stir very lightly.

28. *Eggnogg, No. 2.* — Beat up one egg with a tablespoonful of sugar. Stir into this a cup of fresh milk, an ounce of sherry, or half an ounce of brandy, and a little nutmeg.

29. *Hot Eggnogg.*—Beat together the yolk of an egg and a tablespoonful of sugar, and stir into a pint of milk at the boiling-point. Add a tablespoonful of brandy or whiskey, and grate a little nutmeg over the the top.

30. *Syllabub.*—Dissolve two teaspoonfuls of sugar in a tablespoonful of wine, put it in a pint pitcher, and take it to the cow. Milk into it till the foam reaches the top.

31. *Egg Water.*—Stir the whites of two eggs into half a pint of ice-water, without beating, add enough salt or sugar to make it palatable. Good for teething children with diarrhœa.

32. *Egg Broth.*—Beat together one egg and half a teaspoonful of sugar till very light, and pour on a pint of boiling water, stirring well to keep it from curdling. Add salt, and serve hot.

33. *Hot Milk and Water.*—Boiling water and fresh milk, in equal parts, compose a drink highly recommended in cases of exhaustion, as it is quickly absorbed into the system with very little digestive effort. This is also true of the egg broth above described.

34. *Lemonade with Egg.*—Beat one egg with two tablespoonfuls of sugar until very light, then stir in

three tablespoonfuls of cold water, and the juice of a small lemon. Fill the glass with pounded ice, and drink through a straw.

35. *Barley Water.*—Wash two ounces of pearl barley in cold water. Then boil for three minutes and throw both waters away. Add two quarts of boiling water and boil till reduced to one quart—or about two hours—stirring frequently. Strain, add the juice of a lemon and sweeten. For infants omit the lemon.

36. *Toast Water.*—Toast three slices of stale bread to a very dark brown, but do not burn. Put into a pitcher and pour over them a quart of boiling water. Cover closely, and let it stand on ice until cold. Strain. Good for nausea from diarrhœa. A little wine and sugar may be added if desired.

37. *Apple Water.*—Slice into a pitcher half a dozen juicy sour ápples. Add a tablespoonful of sugar, and pour over them a quart of boiling water. Cover closely until cold, then strain. Slightly laxative.

38. *Gum-Arabic Drink.*—Dissolve an ounce of gum-arabic in a pint of boiling water, add two tablespoonfuls of sugar, a wine-glass of sherry, and the juice of a large lemon. Cool and add ice.

39. *Flax-seed Lemonade.*—Into a pint of hot water put two tablespoonfuls of sugar and three of whole flax-seed. Steep for an hour, then strain, add the juice of a lemon, and set on ice until required.

40. *Potus Imperialis.*—To a quart of boiling water add half an ounce of cream of tartar, the juice of one lemon, and two tablespoonfuls of honey or sugar. Let it stand on ice until cold.

41. *Irish Moss.*—Wash thoroughly a handful of Carrageen moss, pour over it two cups of boiling water, and let it stand where it will keep hot, but not boil, for

two hours. Strain, add the juice of one lemon, and sugar to taste.

Slippery-elm may be used in the same way, a teaspoonful of the powder to each cup of boiling water.

42. *Bran Tea.*—To a pint of wheat-bran add a quart of boiling water. Let it stand where it will keep hot, but not boil, for an hour. Strain, and serve with sugar and cream. This is palatable and nutritious.

43. *Corn Tea.*—Parch brown a cupful of dry sweet corn, grind or pound it in a mortar. Pour over it two cups of boiling water, and steep for a quarter of an hour. This is light and nutritious.

44. *Rice Coffee.*—Parch and grind like coffee half a cupful of rice. Pour over it a quart of boiling water, and let it stand where it will keep hot for a quarter of an hour, then strain, and add boiled milk and sugar. This is nice for children.

45. *Crust Coffee.*—Take a pint of crusts—those of Indian-bread are the best—brown them well in a quick oven, but do not let them burn; pour over them three pints of boiling water, and steep for ten minutes. Serve with cream.

46. *Tea.*—Tea should be made in an earthen pot, first rinsed with boiling water. Allow a teaspoonful of tea to each half pint of water. Put in the tea, and after letting it stand for a few moments in the steaming pot, add the water, freshly boiling, and let it stand where it will keep hot, but not boil, for from three to five minutes.

47. *Coffee.*—Stir together two tablespoonfuls of freshly ground coffee, four of cold water, and half an egg. Pour upon them a pint of freshly boiling water, and let them boil for five minutes. Stir down the

grounds, and let it stand where it will keep hot, but not boil, for five minutes longer. In serving put sugar and cream in the cup first, and pour the coffee upon them.

48. *French Coffee.*—Some people prefer filtered coffee to boiled. This is best made in a French biggin, consisting of two tin vessels, one fitting into the other, the upper one supplied with strainers. The coffee, very finely ground, is placed in this, and the boiling water allowed slowly to percolate through it. The pot is to be set where it will keep hot, but not boil, until the water has gone through. Pouring it through a second time will make it stronger. *Café noir* is always made in this way.

49. *Coffee and Egg.*—Boil together for five minutes a tablespoonful of ground coffee, a quarter of an egg, a quarter of a pint of milk, and a quarter of a pint of boiling water. Beat an egg and four teaspoonfuls of sugar together until stiff and light, and strain the boiling coffee into it, stirring all the time. Add two tablespoonfuls of hot cream. This is only to be given in small quantities.

50. *Chocolate.*—Scrape fine an ounce of Baker's chocolate, add two tablespoonfuls of sugar and one tablespoonful of hot water; stir over a hot fire for a minute or two until it is smooth and perfectly dissolved, then pour into it a pint of boiling milk, mix thoroughly and serve at once. If allowed to boil after the chocolate is added to the milk, it becomes oily, and loses flavor. Broma is made in the same way.

CHAPTER IX.

The intestinal tract—Enemata—purgative—refrigerant—anthelmintic — astringent — nutritive — Care of appliances — Suppositories — Vaginal and rectal douches.

THE intestinal canal is formed by the folds of a single long tube, some twenty-five or thirty feet in length. That part of it nearest the stomach is called the small intestine—various subdivisions, respectively, the duodenum, jejunum, and ileum ; the last five or six feet are of much greater diameter, and therefore spoken of as the large intestine. This also is subdivided into the cæcum, the colon—ascending, transverse, and descending—and the rectum. It is not directly continuous with the small intestine. The enlargement is abrupt, at right angles to the ileum, and separated from it by a valve. This ileo-cæcal valve allows free passage to the contents of the small intestine, but firmly resists pressure from the cæcal side. At the end of the cæcum is a small closed tube, called the vermiform appendix, whose uses are unknown. A continual motion is kept up in the intestines, by means of which their contents are propelled along. These movements are termed peristaltic. The process of digestion is completed in the small intestine ; whatever passes beyond this is merely the waste and innutritious residue of the food, and undergoes no further digestive action. The intestines and all the other abdominal viscera are bound together and held in place by a strong membrane, the peritoneum.

An enema, or clyster, is a fluid preparation for injection into the rectum. Enemata may be used to secure or control evacuations of the bowels, to obtain remedial effect, local or general, or for the administration of nourishment. According to the purpose for which they are given, they may be classified as purgative, emollient, astringent, sedative, anthelmintic, refrigerant, nutritive, etc.

Purgative enemata are in general use for the relief of constipation. They produce the desired result not simply by washing out the accumulated fæcal matter, but by distention of the rectum and lower part of the bowel, occasioning a reflex stimulation, and increased peristaltic action of the whole intestinal tract. They are found to act efficiently even when the matter is lodged high up in the intestine, beyond the ileo-cæcal valve. A small enema often fails when a large one would be operative. To an adult should be given from one to four pints; a child requires but half as much, and for an infant one or two ounces will be sufficient. Having carefully protected the bed, place the patient on the left side, with the knees flexed. In an obstinate case, an advantage will be gained by adopting the Sims, or the knee and chest position. If the rectum is packed, it may be necessary to remove some of the fæcal matter with the fingers before the tube of the syringe can be introduced. Ordinarily, the rectum will be found empty, the accumulation being in the lower part of the colon, above the sigmoid flexure.

Pass the fluid several times through the syringe to expel the air; oil the nozzle and insert it very gently upward, slightly backward, and toward the left. Under no circumstances use force. See that the end of the tube moves freely in the rectum, neither pressed against the sacrum, nor imbedded in a fæcal mass. Give the injection very slowly; sudden distension of the rectum will produce an immediate and imperative desire for relief. It is a process about which it is impossible to hurry. If the patient complains greatly of pain, rest a little; after a delay of a few moments you can usually go on without distress. The anus may be supported by a folded towel, or, where there is little control of the sphincter, two or three fingers will have to be passed into the rectum by the side of the tube. After the desired amount has been injected, remove the tube gently, and, continuing to support the anus, keep the patient perfectly quiet for ten or fifteen moments. If a full enema can be retained for this length of time, there will in ordinary cases be little doubt of a satisfactory result. A bulb syringe, as the Davidson, is the best for giving a purgative enema. Water alone may be used, or, where something more stimulating is called for, various medicaments are added, as soap, salt, olive or castor-oil, ox-gall, etc. Soap-suds are excellent and convenient. An enema of this sort may be rendered more certain in its action by the addition of a couple of ounces of oil and half an ounce of turpentine; these, with a small quantity of the soap-suds, should be first injected, and followed by the bulk of the fluid. An injection of olive-oil, ℥ iv – ℥ vj, may be given half an hour before one of water, and allowed to remain, in order to soften the fæcal mass. After any operation upon the genital organs, or the anus, where there is likely to be a strain upon sutures, such an enema may be given before each movement. Oil should always be first warmed, as, when cold, it is too thick to pass through the syringe readily. Another enema exceedingly useful for softening scybalous masses in the rectum is of a solution of inspissated ox-gall. It should be retained for about an hour, and then be followed by a large enema of soapsuds. This is used especially after operation for laceration of the perinæum through the sphincter.

As to the best temperature for evacuant enemata, authorities differ. Hot or cold water will naturally excite the intestines to more vigorous action than water of the same temperature as the body. Either may be used without inconvenience to the patient. The daily injection of a pint of cold water is often advised, in case of constipation attended by bleeding hæmorrhoids.

The habitual use of large evacuant enemata is to be discouraged, as causing undue distention, and a somewhat torpid condition of the bowels.

When there is an irritable condition of the mucous membrane, enemata of a more soothing nature are indicated. Thin gruel is often used, or a decoction of flaxseed, starch, or barley. Emollient enemata should always be warm.

A refrigerant enema is an injection of clear cold water, given to reduce a febrile temperature. Injections of ice-water are also given to check hæmorrhage from the bowels.

Anthelmintic enemata are given to destroy worms. Only a small quantity need be used ; for an adult half a pint is sufficient, for a child still less. The remedy to be employed will be prescribed by the physician to suit the case. Salt, quassia, aloes, tincture of iron, and weak carbolic acid are among those used. Avoid making the solution too concentrated, as it may excite inflammation.

To check diarrhœa, are frequently given enemata of starch thin enough to pass readily through the syringe, to which has been added a prescribed quantity of laudanum, usually about thirty drops to two fluid-ounces of starch. These may be ordered after each movement, or regularly every few hours. The action is at once sedative and astringent. Other astringents, as sulphate of copper, or acetate of lead, are sometimes similarly employed.

Sedatives are given by rectum for the relief of pain in the region of the pelvis. It takes, as a rule, a third more of any drug than the dose given by mouth, to produce the same effect *per rectum.* Any rectal injection intended to be retained must be given very slowly, in quantity not exceeding four ounces, and of a temperature not less than 100° Fahr. Quiet must be enforced for some time after it is taken. The best instrument for such is a hard-rubber syringe holding the exact quantity. Especially do these directions apply to nutrient enemata, which are used when sufficient food can not be received or disposed of by the stomach. The possibility of nourishing in this way is often the means of saving life. Any highly concentrated liquid food may be given—milk, beef-tea, whipped eggs, etc. Defibrinated blood has been thought valuable. A variety will be better than any one kind exclusively. A useful mixture is three ounces of beef-tea, half an ounce of brandy, and one of cream. Brandy, or some other form of alcoholic stimulant, is often given together with the nourishment, as in this formula, but it is so irritating that its use can not be long continued. As food given by rectum has not been through the regular digestive processes, it must, to be easily assimilated, be subjected to artificial digestion. Therefore, pepsin or pancreatic extract is commonly added to it. Beef-juice, prepared in accordance with recipe No. 3 of the preceding chapter, is excellent for administration in this manner. Solutions having a slightly acid reaction are absorbed with the greatest facility. These injections should not be given too frequently, or they may fail to be retained; absorption is slow, and the rectum not very tolerant of foreign matter. Once in five hours is often enough, and four ounces the maximum quantity. If so much can not be borne, try three, two, or even one at a time. Before giving a nutrient enema, it is important to ascertain whether or not the rectum contains fæces. If it is not found empty, it will be necessary to give first a purgative enema.

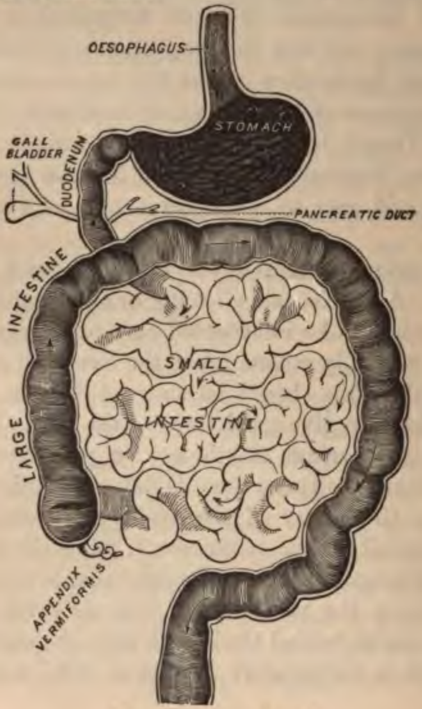
After using a syringe, clean it by letting plenty of warm water run through it, wipe it on the outside, and hang it up by the extreme end to drain. Never put it away in the box wet. A hard-rubber syringe shrinks in drying, and if left long unused will be apt to leak, but this can be remedied by soaking in hot water. A bed-pan should always be warmed before use by dipping in hot water. Dry it carefully, and, if any difficulty is found in adjusting it, oil the edges. Have a little disinfecting solution in it.

Suppositories are solid bodies for introduction into the rectum, answering, to some extent, the same purposes as enemata. They are of various sizes, conical or spherical in form, and, while firm enough to retain their shape under ordinary conditions, are sufficiently soft to melt under the heat of the body. They are usually made of cacao butter, in which some medicinal agent is incorporated. They have the advantage of facility of application, and being of little bulk are easily retained. Opium is often given in this form for the relief of local pain or diarrhœa. Suppositories of soap or boiled molasses are given to children for laxative purposes, and are very effective. A suppository, having been first oiled, should be introduced very gradually and gently into the rectum, the patient lying on the left side as for an enema. It should pass well beyond the sphincter ani, and it is well to keep the finger applied for a moment, until the rectum becomes accustomed to its presence, to lessen the danger of its immediate expulsion.

In the case of female patients the nurse will frequently have to give the vaginal douche. This, when tepid, is simply for cleanliness; but the hot douche has a distinct therapeutic effect on congested or inflamed pelvic tissues. At first the congestion is increased; but a continued application of the hot water causes a secondary and more or less lasting contraction of the blood-vessels. Thus it is an excellent hæmostatic in all forms of capillary hæmorrhage. It also induces uterine contractions, and acts, to a certain extent, as a local anodyne.

The patient should lie on the back, with the hips elevated. A douche taken sitting or standing is of very limited utility. An interrupted current is more beneficial than a steady stream; but the Fountain syringe is much used. This should be suspended from a considerable height, to give good force to the flow. The long nozzle of the syringe should not be perforated at the immediate extremity, as there is danger of injecting the water into the cavity of the uterus and doing serious harm, especially after confinement, when the mouth of the uterus remains open. The tube should be carefully passed along the posterior vaginal wall until it has reached a point behind the cervix, then the water slowly injected at a temperature at first of 100°, but rapidly increased to 110°, or over. Any medication ordered should be included in the last quart. Continue for fifteen or twenty minutes. A bed-pan with an overflow-pipe is needed. Care must be taken that the mucous membrane is not blistered by the hot tube. For this reason ivory or hard-rubber nozzles are preferable to those of metal.

A hot rectal douche is sometimes used, with the idea that the heat can so be applied more directly to the affected tissues than through the vagina. The water must, in this case, be allowed to escape from the anus by the side of the tube.



The Alimentary Canal.

CHAPTER X.

Local applications—Counter-irritants—rubefacients—vesicants—pustulants—issues and setons—Cupping, dry and wet—Leeches.

BESIDES general remedies are numerous local or topical applications, either irritant, soothing, or protective. Such as protect by arresting fermentation are called antiseptic. These will be spoken of later.

Counter-irritants relieve inflammation of the deeper parts by drawing the circulating fluid and the nervous energy to the surface. There are two distinct degrees of them—rubefacients, producing merely local warmth and redness, and vesicants, epispastics, or blistering agents. Still a third class produce a pustular eruption over the surface to which they are applied. Of this kind are Croton-oil, and tartrate of antimony.

Counter-irritants are applied usually over or near the seat of disorder, but sometimes at a remote part, to obtain what is called revulsive action. In this way mustard poultices on the feet, or a mustard foot-bath, may be employed for the relief of the head.

Mild counter-irritation results from hot fomentations and poultices, and from the various ammoniacal and camphorated liniments. One of the most commonly used rubefacients is mustard. To make a mustard plaster or sinapism, take one part of powdered mustard and from two to five times the quantity of flour, according to the strength desired. Mix into a paste with tepid water, and spread it evenly between two pieces of muslin. Hot water or vinegar, often recommended, will weaken the active principle of the mustard, and though, when made with tepid water, the plaster on first application feels cold, it soon gets warm. It should not be left on long enough to vesicate, as the sore produced is painful and slow to heal. From twenty minutes to half an hour is usually long enough. With an insensible or delirious patient, the action must be carefully watched; if neglected, deep ulceration may ensue. For a child, it is well to mix it with one third glycerine, instead of pure water, as the action will be less severe, and it can stay on longer. Confine in place with a bandage. The burning sensation which follows the use of a mustard plaster may be relieved, if extreme, by dusting the part with flour or fine starch, or dressing it with vaseline, and covering with cotton to exclude the air. Cayenne-pepper plaster is made by mixing a tablespoonful of cayenne into a thin paste of flour and water. Spread like a mustard paste. Or a quantity of red pepper may be stitched into a flat flannel bag, wrung out in warm water, and applied over the seat of pain. Rigollot's mustard leaves, the mustard paper, and capsicum plasters of the pharmacopœia, are prepared for use by simply dipping in tepid water. They are neat, quickly ready for use, and very effective.

Similar local stimulation may be obtained from bits of cantharidal plaster, kept on for an hour or two, but removed before the point of vesication is reached. These are called "flying blisters." The same effect follows the rapid passage of a hot iron over a piece of brown paper, or thin flannel, laid upon the skin. This will often relieve lumbago or chronic rheumatism. Reddening only is desired. The chief use of the actual cautery is as a rubefacient. The burn is dressed like any other of little depth; usually with lint dipped in a solution of bicarbonate of soda, and covered from the air with rubber tissue.

To produce vesication, the agent most commonly employed is cantharides. This should not be applied where the skin is broken or tender. If it is very thin, as in case of a child, a piece of oiled tissue paper may be interposed between it and the cantharidal plaster. This is said to lessen the danger of strangury, while it accelerates rather than retards the action of the blister, as the active principle of cantharides dissolves in oil with great rapidity. The part should first be washed and dried, shaved if there is any hair upon it, and the plaster secured in place by a bandage rather than by adhesive strips, as the latter may be drawn upon painfully as the blister rises. This should take place in from four to eight hours. If it does not rise within twelve hours, it should be removed and a poultice applied, which will usually produce the desired effect. In taking off the plaster, be careful not to tear the skin, and clean off with a little oil any adherent particles. When the blister is well raised, make a slight incision at the lowest point for the escape of the serum, and dress with vaseline or simple cerate. Or, the direction may be to leave the blister undisturbed, allowing the fluid to be reabsorbed. Or again, the entire cuticle raised may be cut off, and the blister kept open and dressed with basilicon, savin, or some other irritating ointment. This constitutes a "perpetual blister." These are now not often used; a succession, each allowed to heal, being considered preferable. Ill effects, as strangury and congestion of the kidneys, sometimes follow the prolonged use of cantharides. It has been supposed even to have induced premature labor. Camphor corrects the action of cantharides upon the bladder. For this reason, another method recommended of preparing cantharidal plaster for use upon a child is to sprinkle it with a solution of camphor in ether. The ether will evaporate in a few seconds, and a film of camphor be deposited evenly over the surface. A blister will usually be raised upon a young child in from two to four hours; it should be carefully watched, and not allowed to remain too long. Remove when the skin is well reddened, and poultice. The cantharidal collodion is a convenient form, well adapted to uneven surfaces, as it can not get out of place. One or two coats are applied by a camel's-hair brush; if covered by oiled silk or rubber tissue, it works rather more quickly. The tincture of iodine is applied in the same way; it is much milder in its action, several coats and repeated applications being usually required to produce a blister. If it burns too severely, it can be washed off by ammonia or alcohol.

When it is desirable to vesicate very quickly, stronger ammonia or chloroform is used. A piece of lint or cotton saturated with it is placed upon the skin, its evaporation being prevented, and its irritating action limited, by covering it tightly with a watch-glass, or the cover of a pill-box. A blister will be raised in five or ten minutes. This method is always painful; the ammonia, if left too long, will eat into the flesh.

Croton-oil or antimonial ointment is rubbed into the surface with a piece of flannel, a very small quantity at a time, at intervals of four or five hours, until the eruption appears.

A form of counter-irritation, similar to that of perpetual blisters, is afforded by issues. An issue is established by making a hole in the flesh with a fragment of caustic potash, and kept open by a pea or bead, confined in it.

Another way of maintaining a constant discharge is by a seton. A small incision is made, and a piece of silk or rubber cloth inserted. Remaining in the wound, it keeps it from healing. The silk should be moved daily, and the matter well cleared out.

Cups are applied to relieve congestion, to abstract blood, or to prevent active absorption. For the relief of pain, dry cupping is the most practiced. It is an operation requiring much nicety in its performance. The articles needed are cupping-glasses—in the absence of the regular apparatus, small tumblers or wine-glasses, with smooth edges, may be used—a spirit-lamp, a saucer of alcohol, a stick with a bit of sponge or a wad of lint on the end, and plenty of soft towels. The lamp should stand between the patient and the alcohol. Have the cups perfectly dry. Dip the sponge in the alcohol, ignite it from the lamp, and let it burn for an instant in the inverted glass. Then withdraw and extinguish it, at the same time rapidly placing the glass over the affected part. The heat will have rarefied the air in it, and as it condenses, on cooling, a partial vacuum is formed, to fill which the skin will be forcibly sucked up, and the blood drawn toward the surface. Each cup may remain on from three to five minutes, being removed before discoloration takes place. From fifty to one hundred and fifty are generally used. They can not be applied over a bony or irregular surface. A second cup must not be put in the ring left by a former one. Above all things, avoid burning the patient, either by using the alcohol too freely, so that it drips, or by getting the edges of the glasses too hot. To remove a cup, make pressure with a finger close to it, so that the air will be admitted. Dry it well before using it again. Dr. Quain advises that, instead of, as is usual, allowing a cup to remain stationary, it be slid back and forth along the surface. In this way the formation of effused circles is avoided, and a large tract can be treated with one or two cups. Another apparatus consists of glasses furnished with rubber bulbs for exhausting the air. The nurse will not infrequently be called upon for dry cupping. Wet cupping is always attended to by the physician. A scarificator, lint, and adhesive straps will be required, in addition to the articles already mentioned. After cupping in the usual manner, the scarificator will be applied, making a series of slight cuts. The glasses will then be replaced. Or sometimes the scarificator will be applied before using them at all. When sufficient blood has been abstracted, the hæmorrhage can be easily stopped by pads of lint. A dry dressing, or some simple unguent, is all that is needed. Wet cupping is most frequently used in the lumbar region, to relieve inflammation of the kidneys.

Leeches are commonly used when it is desired to take a small quantity of blood from any locality. They affect a more limited space, and are preferable to cups if the parts are at all sensitive or inaccessible. There are two varieties, the American and the foreign. The former has three stripes down the back, the latter five or six. The foreign leech is larger and more voracious, drawing four or five times its own weight of blood. A leech will draw more blood from a young child than from an adult, owing to the thinness and greater vascularity of the skin. For this reason domestic leeches are generally chosen for children. They should not be applied over any large vessel, but over a bony surface upon which pressure can be made in case of excessive hæmorrhage.

There is sometimes difficulty in making leeches bite. The part to which they are to be applied must be perfectly clean, washed first with soap and water, and again with pure water. The leech itself should be clean ; it may be washed and dried in the folds of a towel, but never handled. Strong odors in the room, as of sulphur, vinegar or tobacco, will affect the leech ; it may even refuse to bite when the patient has taken certain drugs internally. Various devices are proposed for inducing a leech to take hold : a slight scratch, just sufficient to give the taste of blood will usually overcome any hesitation. Or put the leech in a wine-glass of water, cover with a card and invert over the place. Hold it close and slip out the paper, when the leech, being in his native element, will probably sink and fasten promptly. Then the glass can be taken off, and the water absorbed by a towel. Near the eye, or wherever the exact spot of attachment is important, a test-tube, leech-glass, or small bottle, may be used in place of the wine-glass. If the leeches are to be applied inside the mouth or nostrils, it is well to put threads through their tails. It will not interfere with their working, and will keep them from being swallowed. Should such an accident occur, they can be at once rendered harmless by drinking freely of salt and water. A leech should suck from three quarters of an hour to an hour. If they seem sluggish, they can be excited to action by gentle stroking with a dry towel. When full they will drop off. If you wish to take them off sooner, sprinkle a little salt on their heads. Never remove by force, or the teeth will be left in the wound, where they may occasion abscess or erysipelatous inflammation. The leech-bite leaves a permanent stellate scar. The bleeding may be encouraged by hot fomentations or poultices, or checked, if too profuse, by a compress of lint, an application of ice, or, if it resists these, by touching with nitrate of silver. A patient should never be left for the night till all bleeding has ceased.

After they have been used, the leeches may as well be thrown away, as it is only after a long time and considerable care that they will ever be good for anything again. Leeches not used may be kept in a jar of water, with sand in the bottom, and having a perforated cover. The water must be changed every four or five days. A piece of charcoal in the water will help to keep it pure.

CHAPTER XI.

Poultices of various kinds—Fomentations—Modes of applying heat and cold locally—Lotions and similar applications.

POULTICES, also called cataplasms, are in common use as convenient means of applying warmth and moisture. Their effect is to soften the tissues and dilate the capillaries, relaxing the tension of inflamed parts, and so relieving pain. Applied early, they may check the progress of inflammation, and prevent the formation of pus; when suppuration has set in, they facilitate the passage of matter to the surface, and limit the spread of inflammation. They are useful not only when in immediate contact with inflamed tissues, but will also often relieve deep-seated pain. A poultice applied for the relief of the internal organs, or to hasten maturation, ought to be large enough to extend over a considerable surrounding surface, but, over a suppurating wound, should be but little larger than the opening. Apply as hot as can be comfortably borne, but do not burn the patient. There is danger of this with the thin and sensitive skin of a child, and in cases of paralysis, when the generally lowered condition gives rise to an inability to resist heat and cold, and the skin may be blistered by a poultice that would produce little effect on a healthy subject. Cover with some impervious material—oiled muslin or rubber tissue—to keep in the heat, and change frequently, the exact time depend-ing upon the thickness of the poultice. One of ordinary size will keep warm for three or four hours. If allowed to become cold and hard, it will do more harm than good. Poulticing should not be too long continued, or it may retard rather than help the healthy processes, by rendering the flesh sodden and irritable; it may even develop an eruption.

Poultices are made of various materials. The simplest form consists of several thicknesses of lint or soft cloth, wrung out in hot water. A convenient substitute is spongio-piline, which is made of two or three layers of sponge and wool, felted together, and coated on the outer surface with caoutchouc. This holds the heat a long time.

Linseed-meal is very generally used, and when of good quality is an excellent material. To make a linseed poultice, bring a saucepan of water to the boiling-point, and, without removing it from the fire, stir into it the meal little by little, until it has the proper consistency—just thick enough to be cut with a knife. It must be smooth and perfectly free from lumps. That eccentric old genius of the last century, Dr. Abernethy, says that, if it is perfectly worked together, you might throw your poultice up to the ceiling, and it would come down without falling in pieces. The poultice should be spread evenly, about a quarter of an inch thick, upon a piece of muslin previously cut to the desired size, leaving an inch and a half of margin in each direction. Bartholow advises that the muslin be twice the length of the intended poultice, only half of it spread, and the remainder folded back as a cover, but it is rather better to have a separate cover of some thinner material, as mosquito-netting, old tulle, or illusion, if such can be obtained, and to fold over together like a broad hem the edges of both. This makes a strong border. The cover is sometimes entirely omitted, and the poultice applied directly to the skin, but portions of it are likely to adhere, so that it becomes difficult to remove it neatly. A little oil on the poultice will help to keep it soft, and make it less likely to stick. A layer of cotton-wool on the outside will help to retain the heat; and when the weight of a poultice is painful, and it has in consequence to be made thin, it will be found a valuable addition. Sometimes a flannel bag is made to contain the poultice, one end being left long and free to fold over it. The best way to apply a large poultice for the relief of the internal organs is to make one or two turns of a flannel bandage about the part, and then to apply the poultice in such a bag, and confine it in place with the rest of the bandage. So arranged, it will keep hot a long time.

A small board, or a tray, on which to carry the poultice to the patient, will be found very convenient, and is in hospitals always used. Quite as important is it to have a basin in which to carry away the old one. If it is to be applied to a wound, the old poultice will have been removed, the wound washed, and protected by a "guard"—a piece of muslin wet with some disinfecting solution—before the fresh one is made.

A poultice-jacket is sometimes prescribed, to envelop the entire chest. This is made in two pieces, front and back, with strings to tie over the shoulders and under the arms. The edges must be firmly sewed, to keep the poultice from escaping.

Bread poultices are lighter and more bland than linseed, but cool quickly and hold less moisture. Not having the tenacious quality of linseed, they are likely to crumble and become rough as they dry. Milk ought never to be used in their preparation, as it has no advantage over water, and it very soon becomes sour and offensive. Pour boiling water over slices of bread without crust. Let them simmer a few moments until well soaked, then drain off the water, beat up the bread quickly with a fork, and spread.

As bread is more porous than linseed, it forms a better basis for the charcoal poultice. The formula given is: Fresh wood charcoal-powder, ℥ ss.; bread crumbs, ℥ ij; linseed meal, ℥ iss.; boiling water, ℥ x. Mix half the charcoal into the poultice, and sprinkle the rest either over its surface or directly upon the wound. This poultice needs very frequent renewal. It is used for putrid sores; it absorbs the fetid odor and promotes a healthy condition, but it is always a dirty application, and other neater and equally effective antiseptics have largely taken its place. A linseed poultice may be made with some disinfectant solution instead of pure water, as weak carbolic acid, bichloride of mercury, or solution of chlorinated soda. The latter, as well as correcting the odor, affords moderate stimulation to the wound. It is made in the proportion of one part Labarraque's solution to four of water. Another gently stimulant application is the yeast poultice, mainly used to hasten the separation of gangrenous sloughs. Mix six ounces of yeast with the same quantity of water at blood heat. Stir in fourteen ounces of wheat flour, and let it stand near the fire till it rises. Apply while fermenting. Another recipe given for the yeast poultice is: Mix a quarter of a pound of flour, or linseed-meal, with two ounces of yeast, or beer grounds. The mixture is then heated, being constantly stirred until it is warm. The former is officinal.

Starch makes a very bland poultice, and retains the heat well. It is used for cancers and to allay the irritation of skin diseases. Make as for laundry use; mix first with cold water, and then add boiling water until it thickens.

Powdered slippery elm, Indian, and oatmeal are also used for poultices. A very light and soothing one may be made of one part slippery elm to two parts linseed-meal. Scraped carrots, boiled or raw, are thought to have an especially cleansing effect; onions and horse-radish are sometimes used for their stimulating properties. A hop poultice is a thin bag loosely filled with hops, and wrung out in hot water. Bran is treated in the same way. A bran jacket may be made like that of linseed, above described, and has the advantage that the same one can be rewet and used again and again. It needs to be stitched through and through, as well as round the edges, to keep the bran in place. Bandage close to the body with a wide roller.

Laudanum is often added to a simple poultice, or sprinkled over its surface, for the relief of pain. Another sedative poultice sometimes ordered consists of one part powdered hemlock-leaf to three parts linseed-meal. In either case the constitutional effects of the drug are to be looked out for.

Camphor, incorporated in a bland poultice, is sometimes applied to the perinæum for the relief of strangury.

A spice poultice is made by mixing ginger, cinnamon, clove, and cayenne pepper, a teaspoonful of each, with half an ounce of flour, and brandy enough to make a paste. The same effect, that of mild counter-irritation, may be produced by sewing the spices into a bag, to be dipped into whiskey or brandy when required for use.

A mustard poultice is made by the addition to a simple linseed poultice of a prescribed proportion of mustard, usually from one eighth to one fourth.

Fomentations are poultices in modified form, applications of hot water, pure or medicated, by means of pieces of flannel, cloth, or sponge. They have the advantages of being clean, light, and quickly prepared; but they require constant attention, needing to be changed every ten or fifteen minutes. Two pieces of flannel should be at hand, each doubled to the desired size. These are called stupes. They are to be saturated with boiling water, and wrung out as dry as possible. For this purpose a stupe-wringer is needed—a piece of stout toweling with a stick run through the hem at each end. Put the stupe in the middle of this, saturate with boiling water, and twist the sticks in opposite directions until no more water can be squeezed out. A towel may be used as a wringer, but there is danger of scalding one's fingers. A stupe cool enough to be wrung out by hand is too cool to be of much use. It should be dry enough not to wet the bed or the clothing. Have another all ready to apply before removing the first. There should be two layers, no more. Shake these slightly apart to let the air in between them, and they will keep hot longer. Cover with oiled muslin, an inch larger in each direction than the stupe, and over that lay a piece of dry flannel, or a layer of cotton-wool. The stupe should never be allowed to get cold. After the fomentations are discontinued, carefully dry the part to which they have been applied , and keep it covered for a time with a warm, dry flannel. Fomentations are not applied to discharging wounds, as the stupes would at once be soiled. Their chief use is to relieve spasm of the internal organs. They may be made more irritant or sedative by the addition of appropriate medicaments. Twenty or thirty drops of turpentine or laudanum may be sprinkled over each stupe, or it may be steeped, instead of pure water, in some remedial decoction, as of poppy-heads, hops, or chamomile-flowers. A stupe recommended for a child consists of Jamaica ginger, paregoric, and hot water, in equal parts. In using turpentine there is some danger of blistering the skin, and any sore spot must be first covered with some impervious dressing.

When it is better to avoid relaxation of the tissues, "dry fomentations" are employed. Toasted flannel is often used, but it does not retain heat well. Thin bags of heated sand, ashes, or salt, bran or hops, hot bricks, tins, and water-bottles, and all applications of dry heat come under this head. Hot-water bottles should always be rolled in flannel.

Cold applications are used chiefly to subdue inflammation. They are good only in its earliest and latest stages, never when matter is forming, or during sloughing. To be of any use they must be kept cold, and confined to a limited space. If the treatment is begun and suspended, the reaction will render the inflammation more severe than if it had never been undertaken.

The simplest method of applying cold is by pieces of muslin wet in ice-water, and changed for fresh ones before they get warm. This calls for constant attention. A steady cold stream may be kept up over an inflamed part by carrying across it long strips of lint or lamp-wicking having one end in a pitcher of water, standing somewhat higher than the bed, and the other leading to a basin below it. The bed must be well protected; in all applications of water care must be taken that neither it nor the patient's clothing gets wet.

Sometimes coils of rubber tubing are employed, through which a continuous flow of cold water passes.

Ice is best applied in a rubber bag. These come in different shapes to fit the various parts of the body. The bag should be not more than half filled, with bits less than an inch square, and the supply be renewed before the last piece is melted. The ice will keep longer if mixed with one third sawdust. Put a fold of muslin between the ice-bag and the skin, and confine it with a bandage so that it may not slip about. An ice-bladder for application to the head can be folded in a napkin and pinned in position upon the pillow, so that its weight will not press upon the head. In the absence of a regular ice-cap, a cap-shaped sponge may be used, which will absorb the water as it melts. This must, of course, be wrung out before it is saturated. Ice can be finely broken by wrapping it in a stout cloth and pounding it.

All evaporating lotions must be left uncovered. A single thickness of lint is used, and frequently wet. Of this kind are alcohol, vinegar, muriate of ammonia, etc. Other lotions are put on several folds of lint, laid on the affected part, and covered closely with oiled muslin, or rubber tissue. The lint can be rewet without taking it off, by pouring some of the lotion over it.

A lotion applied to the eye is known as a collyrium. Collyria should be introduced at the outer angle of the eye, either by a glass dropper, or a camel's-hair brush used for nothing else. Draw down the lower lid, and tell the patient to look up at the instant the drops are slid in. Moist cloths must never be bound tightly upon the eyes, or they will assume the nature of a poultice, always harmful to those delicate organs.

Liniments differ from lotions in their mode of application, being rubbed in until the part is dry. Liniments usually contain poisonous ingredients, and must be used with care, the hands afterward being well washed before touching any sensitive spot.

Ointments are either spread on lint, the exact size required, or rubbed in like liniments. The rubbing in of an ointment is termed inunction.

The interior of the throat may be treated by gargles or by insufflation, as well as by inhalation, already described. Gargles are fluids thrown in contact with the tonsils, and forcibly agitated by the air from the larynx. About a tablespoonful at a time should be used, four or five times successively. After an acid gargle the mouth should be well rinsed with some alkaline solution, as bicarbonate of soda or lime water, to prevent injury to the teeth.

For insufflation, a rubber air-bag especially designed for the purpose may be used, or a large quill, a piece of glass tubing, or even a hollow roll of stiff paper, filled with the prescribed powder. This is placed as far as possible back in the throat, and its contents either blown in by the operator, or forcibly inspired by the patient.

The nasal douche, once so common, is now seldom prescribed, as there is danger attending its use. If it is followed by pain in the ears, it should not be repeated. The use of the post-nasal syringe and the spray has almost entirely superseded that of the douche.

CHAPTER XII.

The skin: its construction and function—Importance of keeping it clean—Bathing a patient—Changing clothes—The care of the teeth and hair—Hydrotherapy—Effects of cold water—Modes of using it—Warm and hot baths—Air and vapor baths—Medicated baths—Massage, friction, etc.

THE skin is not only a protective covering for the body, but a complex excretory organ, doing as important a work in the elimination of waste products as the lungs and the kidneys. It consists of two distinct layers, the derma, cutis vera, or true skin, underneath; and the epidermis, cuticle, or scarf-skin, on the outside. The true skin is filled with blood-vessels and nerves; the cuticle contains none of these, but is connected with them by numbers of sudoriferous tubes. The surface of the body is closely covered with the openings of these tubes, known as pores. From these pores, water and excrementitious matters are constantly being thrown off in the form of vapor. By this steady evaporation, the temperature of the body is regulated. If the body be covered with an impermeable coating, so as to entirely obstruct this process, death shortly ensues. The scarf-skin is continually scaling off and being renewed from beneath; at the same time, solid matters are to some extent deposited, as the water evaporates from the sweat-ducts. Besides these, there are another set of glands in the skin, called the sebaceous glands, secreting a kind of oily matter, which serves to keep the skin soft and supple. The excess of this sebaceous matter, the cast-off scales of the cuticle, and the solid deposit from the perspiration, remain on the surface, and, unless removed, fill the pores, and prevent further evaporation. Thus, even in a state of health, frequent and thorough ablution is a matter of the first hygienic import. Dirt of any kind blocks the mouths of the sweat-bearing tubes, and impedes their action. This throws more work upon the other excretory organs, disturbing the balance of their functions, so that disease may often be traced simply to a failure to keep the pores of the skin open.

In sickness, it is even more serious, for the exhalations of disease are morbid and dangerous, yet bathing is often neglected through fear that the patient will take cold. But cleanliness is a positive aid to recovery, and, with proper precautions, there are very few patients who can not be washed without danger. In almost all cases, at least a sponge bath in bed can be given, care being taken neither to chill nor fatigue the patient. The bed should be protected by an extra rubber and draw-sheet. The room should be warm and free from draughts, and everything likely to be needed at hand—plenty of hot and cold water, soap, sponges, towels, clean clothing, etc. Take plenty of time, and, exposing only a small part of the body at a time, wash, dry, and cover it before proceeding further. After the bath, some light refreshment may be allowed, if the patient seems at all fatigued. A bath should never be given within two hours after a full meal.

The clothing should always be warmed before it is put on. To change a night-dress, or shirt, slip off the sleeves of the soiled one, and pull it up toward the neck. Then put the arms in the clean sleeves, lift the patient's head and shoulders, and the soiled garment can be slipped off over the head with the same motion that puts on the clean one. Pull the latter down smoothly under the back, but not too tight. In this way the patient has only to be raised once. If he ought not to be lifted at all, the shirt or gown must be ripped all the way down the front. In taking it off, slip out one arm and put on the corresponding clean sleeve, work it under the shoulders, pushing the soiled one before it, and change the other sleeve. If two garments are worn, fit one inside the other before beginning, and put them on as one. Where there is an injured arm or side, begin with it in putting on a garment, but, in taking one off, begin always with the sound side.

The mouth should be often washed, and the teeth brushed, or wiped off with a bit of soft cloth. Water containing a few drops of tincture of myrrh, or of Condy's fluid, is good to rinse out the mouth. To remove sordes from the teeth, a mixture of lemon-juice, glycerine, and ice water, in equal parts, will be found efficacious.

In combing the hair, begin at the ends, holding the hair firmly near the roots, to avoid pulling and to keep the head steady. When the hair is much matted, it is better to cut it short, though, with time and patience, very bad tangles can be straightened out. If the patient is in the hands of a good nurse from the commencement, it will never be allowed to get into such a condition. It is best braided closely, or twisted on top of the head, so that the patient will not have to lie on a knot. The hair should be combed, the teeth cleaned, and the hands and face washed at least once daily, the feet twice, and the whole body once every week. This applies to every patient.

Baths are used for remedial purposes as well as simply for cleanliness. They may be general or local, simple or medicated, cold, tepid, or hot; in the form of liquid, vapor, or air. Judiciously employed, baths are valuable therapeutic agents, but their unadvised use, as is true of all powerful remedies, may be hurtful, rather than helpful. The exact temperature and duration of any bath ordered must be obtained from the doctor, and the effect upon the patient carefully noted. Tanner gives the following temperatures as to be understood when the definite degree of heat is not specified:

Cold	33°– 65° Fahr.
Cool	65°– 75°
Temperate	75°– 85°
Tepid	85°– 92°
Warm	92°– 98°
Hot	98°–112°

To put a feeble patient in a bath, wrap him in a sheet, and lower it gently into the water. Have a warm, dry sheet ready to roll him in when he leaves the bath. Over this fold a blanket, and, putting him in bed, leave him wrapped in them for a few minutes. In this way he will be made dry without extra fatigue. A few long strokes with a soft towel will be all that is needed to complete the process, when the wrappings are removed. If the bath is to be very soon repeated, it is better not to put on the clothes, but to leave the patient folded in a dry sheet, ready for the next plunge.

Cold baths are employed either to produce reaction, refrigeration, or nervous shock. Cold water abstracts the heat of the body, and affects the internal organs through the nervous system. Upon first entering a cold bath there is experienced a sense of chilliness and depression. The pulse is quickened, but the temperature of the surface is lowered, and the blood accumulates in the internal organs. A condition of reaction soon follows, with invigorated circulation, a feeling of warmth and exhilaration ; but if the immersion be too long continued the coldness returns, with weakness of the pulse and general depression. A cold bath should not be given when the patient feels chilly, when there is free perspiration, any visceral inflammation or tendency to congestion of the internal organs, or during menstruation. If shivering comes on during the bath the patient should be at once taken out and put to bed, heat applied, and stimulants given if it persists. The cold bath is sometimes used as a tonic in cases of debility, but there must be a certain amount of vigor to render it endurable. It is best taken in the morning, and followed by vigorous rubbing and gentle exercise. The head must be first submerged, and the bath continued only long enough for the reactionary stage to be reached—not more than five minutes. The colder the water the sooner reaction takes place. The cold bath is a most speedy and effective way of bringing down a high temperature. It may be lowered from one to six degrees. The shock of sudden immersion in cold water may be avoided by beginning with a tepid bath, and gradually reducing it as much as desired, by adding cold water or ice. The personal temperature must be taken by rectum, and the patient removed from the bath before it is lowered to the required point, for it will continue to fall for some little time afterward, until the heat of the interior and exterior of the body becomes equalized.

A more convenient way than plunge baths of applying cold water for the reduction of temperature is by means of a fever-cot. This is a frame covered with sacking, below which a rubber cloth is hung, one end lower than the other. The patient, wrapped in a sheet, lies on the sacking, and has buckets of cold water poured over him at stated intervals. The water runs through into the rubber trough, which conducts it into a pail at the foot of the cot.

Another mode is by the wet pack or envelope bath. To prepare for this, first put three or four blankets on the bed, over these a sheet wrung out in hot or cold water, as ordered. Lay the patient on this, and fold the sheet over him, tucking it in well on both sides from the neck to the ankles, the feet not included. The blankets are then to be folded over him, one by one, in the same way, and the patient left in them from thirty minutes to three hours. Give plenty to drink and keep the feet warm. This treatment is usually very comfortable to the patient, and he will often fall asleep while in the pack. It will render the skin moist, subdue restlessness and delirium, and reduce fever. Upon removal, dry off the patient quickly and wrap in a warm dry blanket for some hours. If the object is simply to reduce temperature, the sheet wrung out in cold water may be employed, without the superimposed blankets, and changed every ten or fifteen minutes. The same effect may be more easily produced by applying towels wrung out in ice-water, dry enough not to drip, one after another, from the neck downward. When the feet are reached, begin again at the head, and renew each in succession, continuing as long as necessary.

Cold or tepid sponging often gives much relief to a feverish condition. Sponge always downward, and wrap the patient, still wet, in a warm blanket, leaving him undisturbed for an hour or two. Alcohol in the water makes it more cooling by its rapid evaporation.

Alcohol alone may be used for sponging, after which do not wipe the patient dry.

If it is desired to produce a shock upon the nervous system, as sometimes when there is disease of the brain or nerves, affusion is employed. This is simply throwing cold water upon the body. The shower bath is one form of it, and the douche another. The latter is most used as a local tonic. The stream should be directed from a height not exceeding ten feet, and, if the affected part is very weak or sensitive, should first be brought to bear upon the surrounding portions, and only by degrees be brought immediately upon it. A douche of hot and cold water alternately is often advised.

A general warm bath is used to induce perspiration, soothe pain, or relax spasm. The effect of warm or hot water is at first agreeable. Transpiration is increased through both lungs and skin, and the circulation accelerated. A very hot bath excites and stimulates the nervous system, while tepid or warm water rather calms and soothes it. If the water is too hot, or the bath too long continued, languor, giddiness, or faintness may supervene. The temperature should be tested with a thermometer, and the same degree of heat kept up throughout. Care must be taken that no part of the body comes directly under the hot-water tap. Keep the head out, and cool. An invalid should never be left alone in the water, and must be taken out of it at once if any sign of faintness appears. A hot bath will not be given during the menstrual period, or in the last stages of pregnancy. Some surgical cases have been successfully treated by long-continued immersion of the injured part in hot water. For this purpose, especially constructed tubs are provided. Immersion in water as hot as can be borne is said to be useful for sprains in their earliest stage.

A foot-bath is usually given to relieve the head, and should be as hot as possible. If the patient is able to sit in a chair, see that he is warmly wrapped up, and cover both patient and tub with a blanket. Let the water come nearly to the knees. Adding mustard will increase the effect. The bath can be given in bed, if necessary, though less conveniently. Have it well protected, turn up the clothes from the foot of the bed, direct the patient to lie on the back, and bend the knees, when the feet can be set in a deep bowl of water. Have it well balanced, cover with a blanket, and let the feet soak from a quarter to half an hour. Then dry them well, and either wrap in flannel or put on woolen stockings.

For a sitz, or hip-bath, the patient is immersed from the knees to the waist, and covered with blankets. The temperature of the water must be well kept up, and the bath prolonged about twenty minutes. The object being to excite the menstrual flow, the bath should be given, as nearly as can be calculated, at the time when that would naturally appear.

For a hot air-bath, an Allen's lamp and a body-cradle are required. The sheets and the patient's clothing are taken off, blankets enough put over the cradle to render it nearly air-tight, and snugly tucked in. The heated air should enter on a level above the patient, whose body should be sponged with tepid water until there is free perspiration. The lamp may be kept burning for twenty minutes or half an hour, and the patient then sponged off with cool water. A vapor-bath may be given with a similar apparatus, or by conducting steam under the cradle from the spout of a boiling tea-kettle. Still another way is by wrapping hot bricks in wet flannel, and setting them on earthen dishes under the cradle.

Both the hot air and vapor-baths may in less severe cases be given in a cane-bottomed chair, constituting a modified Turkish bath. Let the patient, entirely without clothing, sit on a wicker chair, with the feet on a stool. Cover with several blankets, and under the chair burn a spirit-lamp with a large wick. Let the patient drink freely, and, after he has perspired sufficiently, put him in a general bath of 75° or 80°, or pour over him a pail of cold water. Dry thoroughly, and keep him warm afterward.

Both liquid and vapor-baths may be medicated. A mercurial vapor-bath is given like the above, but with a special apparatus for the evaporation of calomel. This, after being deposited upon the skin, is not to be rubbed off. An acid vapor may be produced by evaporating vinegar.

A formula for an acid liquid bath is, nitric acid, f ℥ jss., hydrochloric acid, ℥ j–iij, and warm water Cxxx. This should be given in a wooden tub.

For an alkaline bath, add half a pound of carbonate of soda to fifteen gallons of hot water.

A sulphur-bath is prepared by adding to each gallon of water twenty grains of sulphuret of potassium. This also must be given in a wooden or porcelain-lined vessel, as the sulphides discolor most metals. This is ordered sometimes for rheumatic affections, and sometimes for disease of the skin, in the latter case not usually until the subsidence of the acute stage, as it tends rather to aggravate the rash. With all skin diseases, rain water should be used, or hard water softened by the addition of soda, bran, starch, or gelatine. The skin should not be rubbed, but dabbed dry with soft towels.

For a bran-bath, boil a pound of bran for a quarter of an hour, strain off the fluid, and add it to the bath.

Unless the bran is all strained out, this bath must not be given in a stationary tub. Sometimes it is used without boiling.

For a starch-bath, take half a pound of starch, and mix it with two quarts of water before adding it to the bath.

A salt-bath is usually given cold for tonic effect. Either sea-water may be used, or a solution of rock-salt, in the proportion of one pound to four gallons of water.

After any emollient or soothing bath, the patient should be kept quiet ; after a stimulating bath, energetic friction and exercise are in order.

MASSAGE.

Massage is, in the hands of a skilled operator, a valuable mode of treatment, though it has been somewhat in disrepute, from having been allowed to fall largely into the hands of charlatans, so-called "magnetic mediums," and others of that ilk, whose pretensions have degraded everything associated with them. But it is deserving of rescue, and, as reputable physicians are taking it up and using it appropriately, it is gaining ground in scientific estimation. Massage will, to a considerable extent, take the place of active exercise, keeping the muscles strong and supple. It develops heat at the points of contact, so elevating the general temperature and dilating the vascular system. It furthers absorption, accelerating the motion of the blood currents, removing effete matters, and so promoting nutrition. It has usually a powerfully sedative effect upon the nerves, though in some instances it will be found to excite rather than to soothe. Insomnia and neuralgia can be often relieved by it, and spinal irritation to some extent controlled. In the treatment of nervous disorders it is often combined with rest, rigid dietetics, and electrical excitation. Perhaps the most conspicuously good results are in cases of chronic joint affections and thickening from inflammatory deposits.

Massage consists of a peculiar kneading of the underlying muscles, and is quite distinct from friction and percussion, which touch only the external tissues, but it is often combined with them, and with the "Swedish movements," active, passive, resistive, or assistive. The word, as commonly used, may be understood to embrace all forms of manipulation.

A few desultory lessons will not qualify you to give or teach massage. It takes time, patience, and a great deal of strength to acquire the art, and constant practice to retain any facility in it; for, even when once gained, it is soon lost by disuse. Mere rubbing is often agreeable and useful, but it is not massage.

Theoretic instruction does not amount to much on such a subject, and there are many variations in vogue even among good masseurs, so that the most that can be attempted here is to give a few of the points in which the most rational operators agree, and which experience has shown to be valuable. It is very hard work always—too hard to combine with nursing—but a skilled manipulator will accomplish more in less time, and with less effort, than an inexperienced one. The whole body can be gone over pretty thoroughly in an hour, after which a general rise of temperature of about one degree may be looked for.

The hands need to be at once strong and soft, the motions smooth and even, never jerky. The work should be done from the wrists, not from the shoulders, and you want equal flexibility and freedom of action in both hands. All movements should be begun slowly and gently, and their force and frequency gradually increased. A very tender spot can be barely touched at first, but, after a little skillful handling, an amount of force can be employed which would have seemed incredible. The whole hand, not merely the ends of the fingers, should be used. In malaxation, or massage proper—manipulation of the deeper tissues—the work is chiefly performed by the ball of the thumb and the palm of the hand. Each muscle is kneaded and rolled with carefully graded force. Begin at the extremities and work toward the trunk. If the feet are cold, keep at them until they are quite warm before going on. Take up each group of muscles systematically, compress, rotate, and relax, advancing by degrees, that each handful may include part of what has been previously treated. Never stretch the tissues in opposite directions at the same time. Muscles should be stretched in the direction from their insertion to their origin, from extremities toward the trunk, on the back from the base of the skull downward, and away from the spinal column. On the chest follow the pectoral muscles in the same way, and on the abdomen knead steadiily and firmly the ascending, transverse, and descending colon. Massage of the abdomen often relieves dyspepsia and constipation.

Friction should act only upon the skin. If counter-irritation is desired, a coarse towel, or a brush, is better than the hand. Friction may be vertical, transverse, or spiral. Rectilinear friction should be toward the center of circulation, to assist the venous currents. Thus, on a limb, the heaviest strokes should be upward, the returning ones much lighter. Friction circularly, or at right angles to the long axis, though sometimes practiced, is awkward and of little use. What may be done by such motions can be accomplished more effectively by vertical and spiral movements. In the latter, both hands are used at once—one ascending as the other descends. On the limbs, friction may be applied at the rate of one to five hundred strokes per minute; on the body and thighs, the pressure must be greater, and the strokes longer, so that they can not be as rapid. Malaxation and friction may be used in alternation. Take a small portion of the body at a time, as the space between one joint and another, and manipulate it thoroughly before passing to the next. With them may be combined also percussion over masses of muscle, and the various passive, assistive, and resistive motions.

Passive motions are conducted without any effort on the part of the patient. When there is partial control of the muscular action, the operator either helps or tries to hinder the efforts of the patient, being careful not to overtax his little strength, and the exercises are then known as assistive or resistive. Such movements are applied, together with massage, to strengthen weakened muscles and break up adhesions in diseased or ankylosed joints. It is of importance to know something of their anatomical structure and the limits of natural motion.

What is known as the Roman bath is massage with inunction. When there is a dry and insufficiently nourished skin, inunction may be useful; but it is not an essential part of treatment by massage, though unskilled manipulators often use oil of some kind on their hands to avoid chafing the skin.

The "lomi-lomi" of the Sandwich Islanders is a crude kind of massage.

CHAPTER XIII.

The excretory organs—Normal urine—Variations from the normal, in health and disease—The examination of urine—Tests for albumen—Tests for sugar—Retention and suppression—The use of the catheter—Washing the bladder.

THE principal elimination of waste matter from the body is through the kidneys. These are two bean-shaped bodies, each about four inches long, lying in the lumbar region, one on either side of the spine. The urine, as it is excreted by the kidneys, passes through two connecting tubes—the ureters—into the bladder, whence it is periodically discharged through another tube—the urethra. The capacity of the bladder, fully distended, is about three pints. The urethra in the adult female is an inch and a half or two inches in length.

Urine, in a healthy condition, consists of some 960 parts water to 40 of solid matter, principally urea—the chief waste product of animal life. The average quantity of urine passed in the twenty-four hours is two and a half pints, or forty fluid ounces. This will contain from 450 to 600 grains of urea, besides a small proportion of uric acid, and various phosphates, urates, and chlorides. It is transparent, of pale amber color, having a characteristic aroma, an acid reaction, and a specific gravity of 1020.

There may be considerable deviations from the above standard, even strictly within the limits of health. The quantity will vary in proportion to the amount of fluid taken into the system, and to the activity of the skin. When there is free perspiration, less water is left to be carried off by the kidneys, and, consequently, the urine is less abundant, darker in color, and of greater specific gravity, owing to the increased proportion of solid matter. The specific gravity may vary from 1010 to 1025 without indicating any departure from health. The reaction may for a time become neutral or even alkaline after a meal, owing to the character of the food taken. Diminished transparency may be due to the presence of the earthy phosphates, or the mixed urates of sodium, potassium, calcium, and magnesium, or to mucus from the genito-urinary tract.

The same causes of variation may exist to an extreme degree in sickness. The quantity may be diminished to two or increased to two hundred ounces. The color may be affected either by diminution of the normal coloring matters or by the addition of abnormal ones. Opacity may be occasioned by the presence of pus. Blood gives a characteristic smoke hue to acid urine ; with an alkaline reaction, it is more nearly red. Urine containing blood enough to be readily recognizable as such is probably albuminous. Bile imparts a greenish tinge, often seen with jaundice. In some cases the urine becomes viscid or glutinous ; in a variety known as chylous urine, there is an increased consistency, owing to an addition of molecular fat. In hysteria, alcoholism, anæmia, and convalescence from acute diseases, the urine may be expected to be pale and abundant. In the early stage of acute fever the specific gravity is likely to be high, as a large amount of solid matter is excreted. Lowered specific gravity is most significant when it attends diminished quantity of urine. In diabetes mellitus, the specific gravity of the urine may be as high as 1050, while at the same time the quantity is largely increased. This is due to the presence of sugar. In the disease known as diabetes insipidus, or polyuria, there is an abundant flow of pale urine, but it contains no sugar or albumen, and the specific gravity is proportionately low.

It has already been noted that the food taken may be of a sort to occasion temporary variations in the character of the urine. Certain drugs also produce specific effects upon it. Turpentine taken internally gives to the urine an odor resembling that of violets. It sometimes increases the flow, and sometimes causes retention. Cantharides may also cause retention, or slow and painful passage of urine, known as strangury. Dark, smoky urine is one of the early symptoms of carbolic acid or iodoform poisoning. Santonin gives a brilliant yellow color; rhubarb or senna, a reddish-yellow; cubebs, copaiba, and sandal-oil, each imparts its peculiar odor. Medicines which increase the quantity of urine are called diuretics.

It will be seen that many important indications may be derived from careful observation and examination of the urine. The nurse should always be able to report the frequency of micturition, the quantity passed, and any evident peculiarity. A specimen for examination should be taken either from the total accumulation of the twenty-four hours, or from that passed before breakfast. In warm weather, even healthy urine can not stand for twenty-four hours without becoming decomposed. It is best kept in a tall, narrow glass, tapering toward the bottom, covered with a loose paper cap to keep out the dust. In getting a specimen for the doctor, or for your own thorough examination, care must be taken to have it free from all impurities. Six or eight ounces will be wanted. Put it in a clean bottle with a clean cork, and label distinctly with the name of the patient, the date, and the full quantity of which it is a sample. It may be necessary to use the catheter in order to obtain it free from mucus. Whether or not there is any appreciable sediment, a portion should be set aside for twelve hours, in which time sediment sufficient for microscopic examination may be deposited. Note whether the urine is turbid when first passed, or only becomes so after standing, the quantity and character of the sediment, and whether it floats or sinks.

To determine the reaction, test with litmus paper: if acid, it will turn the blue red; if alkaline, the red to blue; if neutral, it will have no effect upon either. Urine having an acid or neutral reaction may turn alkaline after standing, but that which is alkaline in the beginning never becomes acid. After standing a short time at a moderate temperature, the acidity often increases, but after a longer time, and especially in warm weather, the reaction becomes alkaline, with an ammoniacal odor and a precipitation of sediment. Alkalinity, owing to the presence of ammonia, may be distinguished from that due to the fixed alkalies, potash, or soda, by drying the litmus paper which has been changed by it. If the alkali is volatile, it will disappear, and the paper resume its red hue; otherwise, the blue will be permanent.

The urinometer should have been first tested with distilled water, into which it should sink to 1000. The urine should be well shaken, the glass containing it not too small, as the urinometer must not be allowed to touch its sides. Drop it in the middle, and note carefully the point at which it rests.

Foreign matters in the urine may be either sedimentary or in solution. The most common sediment is composed of the urates and phosphates. They subside into a white or pink deposit. They may be distinguished from each other by boiling a little of the urine in a test-tube over the spirit-lamp, the urates being dissipated by the heat, while the phosphates are precipitated. The latter may be dissipated by adding a few drops of nitric acid. Mucus is unaffected by heat, acids, or alkalies. Pus will be deposited as an opaque white sediment, sinking rapidly so long as the reaction is acid and there is no mucus in which it may be suspended. It resembles the urates, but is not, like them, dissolved on the application of heat. In Bright's disease, albumen is present, and often casts of the tubules of the kidney. The latter are evident only upon microscopic examination.

Urine, to be tested for albumen, should first be filtered, if not perfectly clear. Fill a test-tube to one third its depth, and, if the urine is not of distinctly acid reaction, add one or two drops of acetic acid to make it so. Boil for a moment and then hold it up to the light. Any opacity appearing will be due either to albumen or earthy phosphates. If the latter, it will disappear upon the addition of a few drops of nitric acid. If the fluid remains quite clear after boiling, set it aside for twelve hours, in which time a sediment may be deposited. Anything except albumen will disappear upon a second boiling.

If the proportion of albumen is but small, it may be held in solution by a slight excess of acid, on which account the following treatment is perhaps more reliable :

Fill a test-tube to the depth of half an inch with pure nitric acid. Add to this, by means of a small glass tube, an equal quantity of clear urine, putting it in so gently that it will not mix with, but just overlie, the acid. This can be done by inclining the test-tube and gently rotating the pipette. If there is albumen in the urine, it will appear at the surface of contact as a white zone, of varying thickness in proportion to its quantity. A similar white band may be formed by the mixed urates, if present in excess; but this may be dissipated by heat, while the albumen will be still further defined by it.

Remember that heat precipitates albumen and the phosphates, while the urates are dissolved by it; nitric acid precipitates albumen and the urates, but dissolves the phosphates.

Pale urine produced in large quantity, and at the same time of a high specific gravity, should be tested for sugar. A specific gravity of more than 1028 is sufficient to excite suspicion of its presence. If there is albumen in the urine, it should first be removed by boiling and filtration.

A pretty and delicate test for sugar is by means of Fehling's solution, of sulphate of copper and tartrate of sodium. This needs to be kept tightly corked, and in the dark, as it is decomposed by the action of light. Dilute with five times its bulk of water, and boil. If a precipitate, or change of color, appears on boiling, the solution is worthless, and a fresh one must be prepared. Add, drop by drop, an equal volume of the suspected urine, when, if sugar is present, an orange-red precipitate will appear.

Trommer's test is another quite as commonly used. For this, put a drachm of the suspected urine into a large test-tube, and add a few drops of the solution of sulphate of copper, just enough to give it a bluish tinge. A slight deposit of the phosphate of copper generally falls. Then add, in considerable excess, a solution of caustic potash. This will throw down a precipitate of the hydrated oxide of copper, which, if sugar is present, will redissolve in the excess of alkali upon shaking, making a clear, bright blue fluid. Upon boiling this, there will be a dense and highly characteristic deposit of the red suboxide of copper.

Still a third test is by fermentation. Saccharine urine, in a warm place, will in time ferment, and the process may be accelerated by the addition of yeast. Alcohol and carbonic acid, so produced, are certain evidence of the presence of sugar. Dr. Roberts gives, on this basis, a quantitative test, said to be highly accurate. Take two clean eight ounce bottles ; fill one quite full, and the other half full, of the urine. Into the latter put also a few crumbs of dry yeast (Fleischmann's), and close with a cork having a hole in it to allow the escape of gas. Cork the full bottle tightly, and set both in a warm place for twenty-four hours. Then take carefully the specific gravity of the two specimens. The fermented urine will be found to have lost weight, owing to the destruction of the sugar, the formation of alcohol, and the escape of the carbonic acid. The number of degrees of specific gravity lost will be equivalent to the number of grains of sugar to the ounce in the urine tested.

An absence of the urinary excretion, owing to a failure of the kidneys to act, is known as *suppression*. It is less common than *retention*, the failure to expel that which is in the bladder. The latter may be referred to various causes. The bladder may be paralyzed, or the senses dulled, so that there is no desire to pass urine, even when the bladder is full, or there may be a nervous contraction of the urethra, resulting in an inability to do so, even when the inclination is felt. When no urine has been passed for some time, if there is pain on pressure, on percussion a dull instead of a clear sound, and if the outline of the bladder can be distinctly felt, it may be safely assumed to be full, and the use of the catheter to be indicated. *Incontinence* of urine arises from weakness of the neck of the bladder, rendering it unable to restrain its contents. It is most frequent in children. Apparent incontinence may be really retention with overflow caused by the overdistention of the bladder, and consequent muscular strain. Catheterization may be called for even when there is constant slight passage of urine. In all cases of incontinence, special care is needed to keep the parts clean, and prevent excoriation, by frequent bathing and the application of ointments. Rubber urinals are sometimes used.

Whenever, from any cause, a patient is unable to pass urine voluntarily, the catheter should be used every six or eight hours. If it is properly introduced, and no urine can be drawn, suppression may be inferred. This is a very serious symptom, for, if the system can not be relieved of its waste product, the urea is soon absorbed into the blood, and uræmia, a dangerous form of poisoning, results. Hot applications over the kidneys will sometimes excite them to action. So when the difficulty is retention only, hot applications over the bladder may relieve it; usually will with children. A hot sponge between the thighs may be effective. When the use of the catheter is imperative, proceed as follows: Oil the instrument with the finger. Have the patient flat on the back, if possible, with the thighs slightly separated.

Introduce one finger, also well oiled, into the vagina, and upon it, as a director, slide the point of the catheter till it enters the urethral opening, just below the pubic symphysis. It should not be pushed far enough to strike the walls of the bladder. As soon as the cavity is reached, the end of the catheter will move freely, and the urine will flow through it into the receptacle provided. If the flow ceases before a reasonable quantity has been passed, withdraw the instrument slightly, then push it a little further in than before, when it may begin again. After the bladder is emptied, withdraw the catheter as gently as it was introduced. In no case use force. While removing the catheter, keep a finger over the open end, so that the few drops which it contains will not fall on the bed.

A distended bladder should not be too rapidly emptied by catheter, as there is danger of cystitis from the sudden collapse of its walls. When it is very full, draw only a portion of the contents at first introduction of the catheter, and repeat the process soon.

To pass the catheter skillfully is an important acquisition. It should be done entirely under the bed-clothes; no exposure of the patient's person is necessary. Exception to this rule must be made in case of operation on the perinæum, vulva, vaginal walls, or urethra, when it becomes necessary to introduce the catheter by sight rather than by touch. In these cases the vulva should be washed with warm water after catheterization, or micturition, to prevent any urine from getting into the wound.

The flexible rubber catheter is the most convenient, and least likely to hurt the patient. No. 7 is a good size for ordinary cases. After each use it should be thoroughly cleaned and disinfected. Let a stream of water run through it, first from the eye downward, that any sediment may not be driven down into the point.

In case of cystitis, the bladder will often have to be washed out. For this purpose a double catheter, or an especially designed syringe, is used. Or it may be equally well done by fitting a longer rubber tube tightly over the ordinary catheter, which is then introduced in the usual way. Pour into the tube, through a funnel, the water, or whatever fluid is ordered, not more than two fluid ounces at a time. Lower the tube, and let it run off, and repeat the process until it runs clear.

CHAPTER XIV.

Infectious diseases—Modes of propagation—Disinfectants—The care of a contagious case—How to keep the air pure—To prevent the spread of disease—The care of the dead—Final disinfection and fumigation.

AMONG the responsibilities which have been mentioned as pertaining to the nurse, there is none of greater gravity than the prevention of contagion.

Infectious diseases are supposed to be propagated by the agency of minute living particles, given off from the body of the sick, and conveying the specific poison. They may lie dormant for a time, but under suitable conditions develop and multiply, reproducing the original disease. In some cases the conditions of development are found within the body, and the disease can be directly transmitted from one person to another, while, in others, the germ only originates in the body, and requires to be developed outside before it becomes infectious. Of the latter class are typhoid, yellow fever, cholera, dysentery, and the plague, while all the other diseases commonly recognized as infectious are capable of direct transmission.

After exposure to contagion, some time is required for the development of the infectious germs before they actively manifest themselves. This interval, during which the poison remains latent, is known as the period of incubation. It varies in different diseases, and even in different cases of the same disease, though each has its own characteristic type and mode of development. Small-pox is contagious even during the period of incubation. In measles and whooping-cough, the risk of infection is greatest early in the disease, before the appearance of the specific symptoms, rash and whoop. Scarlet fever is not infectious before the throat-symptoms are present, and is most dangerously so during the third and fourth weeks, when the skin is peeling. The poison of typhus appears to exert its influence only within a limited range ; contact with the patient must be moderately close for infection to take place. But the germs of small-pox or scarlatina may be carried about indefinitely, or lie hidden in a room or in clothes for months, and then under suitable conditions manifest the greatest virulence.

Diseases which attack many people at the same time are termed epidemic ; those confined to particular localities are endemic. Sporadic cases are such as occur singly, and independently of any recognized infectious influence.

Disinfectants are such substances as act upon the specific contagia of communicable disease, and destroy them, or render them inert. They are to be carefully distinguished from antiseptics, preventives of decomposition, and from deodorants, which merely subdue disagreeable smells. Some of the latter may be useful in absorbing deleterious gases, but they have no effect upon the solid particles which convey contagion.

Abundant oxygen is the best disinfectant ; it decomposes the septic germs as it does all other animal organisms. Extremes of heat and cold are also fatal to them.

Whenever any directly communicable disease is found to exist, the first thing to be done is to isolate, as completely as possible, the patient and his attendants. There should be two nurses for every such case, that each may get the daily open-air exercise which is more than ever important, and neither be obliged to sleep in the infected room. They should avoid contact with all outsiders as much as possible, and always change their clothes upon going out. The hair, which can not be changed, should be covered with a close cap. Nothing should be worn in the room which may not afterward be washed or destroyed.

The directions given for the arrangement of a sick-room apply with the greatest force in these cases. All superfluous things, particularly such as can not be washed, must be taken out of the room before the patient is put in it. After he is once quarantined, every article carried out of the room must be disinfected. A set of dishes should be kept for his exclusive use, and washed by the nurse. The bedding, clothing, etc., must not be sent to the general laundry, but washed by themselves after being well soaked in some disinfecting solution. For any minor dressings, and in the place of handkerchiefs when there is a discharge from the throat or nose, use old soft cloths that can be immediately burned. All excrementitious and vomited matter must be disinfected with the greatest care.

There is nothing small enough to be careless about. Even the broom which sweeps the floor should not be used again elsewhere. Do not let the air blow from the sick-room into the rest of the house any more than can not be avoided. It helps to keep the air pure to hang about the room cloths kept wet with some disinfectant. Over the doorway may be hung a sheet similarly dampened. This has at least an excellent moral effect, and moral influences are not without value in dealing with contagion. While neglecting no possible precaution try not to create unnecessary alarm. People afraid of infection are predisposed to it by acquiring a nervous condition which renders them doubly susceptible. Yet the danger is not to be underrated, and insufficient precautions may actually be worse than none, giving an unfounded sense of security.

Take good care of yourself as well as your patient, for the confinement and the isolation make these cases doubly wearing. Try to secure rest and nourishing food at regular hours, and do not let the trouble of having to change your clothes hinder you from getting out of doors every day, even if you are tired. A brisk walk in the fresh air is the best possible disinfectant for yourself.

So, also, the best way of disinfecting the air of the sick-room is by exchanging it for pure air. Air can not be renewed by disinfecting it, any more than it can be disinfected by deodorizing. Neither process renders it fit to breathe again. In all cases of infectious disease, free ventilation is of the first importance. In those diseases in which, as in scarlet fever and small-pox, the infectious particles are largely thrown off by the skin, a good deal can be done toward keeping the air pure by inunction of the skin, which keeps its particles from flying, and by frequent bathing and changing of the clothes.

The burning of pastilles, cascarilla bark, etc., serves rather to add to than to remove the impurities of the air. Charcoal or peat, placed about the room in shallow pans, does absorb a certain amount of poisonous matter. Carbolic crystals exposed in an open dish, or a carbolic solution sprinkled about the room, and on the screens and outer covers of the bed, will quickly correct any offensive odor; but neither of these is to be regarded as a disinfectant. Solutions of sulphate of iron, nitrate of lead, and permanganate of potash, and the various chlorides of lime, soda, and zinc, similarly used, do act as true disinfectants, the former gradually giving off oxygen, and the latter absorbing carbonic acid gas, and liberating chlorine; but as they affect only the air coming in contact with them their influence is not far reaching. The vapors of iodine and bromine and the fumes of nitrous acid have vigorous disinfecting qualities, but, as commonly employed, they are only deodorants, as they can not be used in the sick-room in quantity enough to be useful without exciting dangerous bronchitis. Indeed, any gaseous disinfectant, to be effective, must be used in quantity incompatible with human presence. Chlorine and sulphurous acid are the only two of any great practical utility.

The most powerful and rapid of the liquid disinfectants in general use is the solution of bichloride of mercury (corrosive sublimate). It is also a valuable antiseptic. The solution ordinarily used is of the strength of 1 to 1,000, about fifteen grains to the quart. There is nothing better than this for scouring walls, floors, beds, etc. It may also be used for disinfecting vessels, sinks, and drains; but not for clothing, as it makes an indelible stain. For the latter purpose may be used a solution of sulphate of zinc and common salt, four ounces of the sulphate and two of the salt to a gallon of hot water. Soak the clothes in this for two hours, and then boil them with soda or borax.

Condy's fluid (solution of permanganate of potash) is often recommended, but it can hardly be used strong enough to do any good without staining. The sulphate of iron (copperas) should remove such stains, but itself discolors. Stains from copperas can be taken out by oxalic acid or lemon juice. Carbolic also decomposes Condy's fluid, and is incompatible with chlorine, so that it must not be used in combination with either of them. Chlorine and sulphurous acid mutually destroy each other. Chlorine is soluble in water to the extent of two and a half volumes; the solution can be used as a disinfectant for clothing, etc. It is decomposed by the action of light.

Copperas or chloride of lime may be thrown dry into water-closets and drains with good effect. They should afterward be thoroughly flushed. A little disinfectant should be kept standing in all sputa-cups, urinals, and bed-pans, ready for use. For this purpose the tincture of iodine, or Condy's fluid, is excellent. The latter may be known to have lost its efficiency when it has lost its color.

With disease which is only indirectly infectious—as typhoid and cholera—isolation of the patient is not necessary; but the greatest care is essential in disinfecting those discharges from the body which contain the germs of contagion. All excrementitious matter must be disinfected and disposed of thoroughly and promptly. For stools, cover the bottom of the receiving vessel with a layer of copperas, or chloride of lime, before use. After use, add crude hydrochloric, or sulphuric acid. in quantity equal to half the bulk of the discharge, cover closely, and carry at once from the room. These stools must not be emptied into the common closet. Trenches may be dug to receive them, so situated as not to drain into any source of water supply, or they may be mixed with sawdust and burned. All clothing and bedding, soiled even in the slightest degree with the discharges, must be disinfected with equal care, and boiled. These measures, rigidly taken, will prevent the spread of such disease, unless there is some local cause for it.

When a patient has died from any infectious disease, the body should be washed with some disinfectant, and wrapped in a sheet wet with the same. Labarraque's solution is commonly used. Saturate a large wad of cotton with it, and leave it under the hips. The burial should be as soon as possible, and strictly private.

After a case is ended, whether by death or recovery, the room must be subjected to a thorough process of cleaning and fumigation. Everything that can be so treated should be boiled, or baked in a disinfecting oven at a temperature of not less than 220° F. The floor, woodwork, and, if possible, the walls, should be scrubbed with bichloride of mercury, the mattresses taken to pieces for fumigation, and the bedding washed. Rubber sheets and aprons are best cleaned with Labarraque's solution; they, of course, can not be baked. Everything that can not be otherwise thoroughly disinfected should be hung up in the room while it is being fumigated. All drawers and closets should be left wide open, that the gas may penetrate to every corner. Either sulphurous-acid gas or chlorine may be used for fumigation; the former is usually preferred. They are both powerful bleaching agents, and will discolor metals, so that all metallic surfaces should be first covered with a coating of grease to protect them.

To fumigate a room or ward with sulphur, close the doors, windows, and fireplace, and paste strips of paper closely over all the cracks. Put the sulphur in iron pans, allowing two pounds for every thousand cubic feet of space. Set the pans on bricks so as not to burn the floor, pour a little alcohol over the sulphur and ignite, beginning with the pan farthest from the door by which you are to make your exit. Leave the room quickly, and paste up this door like the others. Keep it closed for twenty-four hours; then open all the windows, and let the room air for as much longer.

When chlorine is used, the same precautions must be taken against its escape. The materials for its production are better placed in the higher parts of the room than on the floor, as the gas is heavier than air. The following is the best way to procure it in quantity: Mix an equal bulk of common salt and the black oxide of manganese in a shallow earthen dish, add two pints of sulphuric acid, previously diluted with two pints of water, and stir with a stick.

The efficiency of both sulphur and chlorine is increased by the presence of steam; the latter especially requires a certain amount of moisture in the air.

CHAPTER XV.

Surgical cases—Wounds of various kinds—Their modes of healing—Inflammation—Blood-poisoning—The treatment of wounds—Surgical dressings—Lister's method—Operations—Giving anæsthetics—Care after operation—Dangers to be anticipated.

WOUNDS of all kinds, with the diseases resulting from them, and such others as are treated by operative or mechanical means, come under the head of surgical cases. A wound is defined as a solution of continuity of the soft parts. It may be of any degree of severity, from a slight contusion to an extensive laceration.

An incised wound is a simple smooth cut, like that of a knife, and is dangerous in proportion to its depth. If the edges are torn the wound is described as lacerated. A lacerated cut will be more painful than a sharp incision of the same extent, but the hæmorrhage will be more easily controlled. A contusion or bruise is a subcutaneous laceration. It will occasion more or less extravasation of blood, known as ecchymosis. If the contusion is accompanied by a rupture of the integument, the discoloration will be less, as the effused blood and serum find an outlet. This constitutes a contused wound. It is usually made by some blunt instrument. The tissues may be crushed beyond recovery, in which case ulceration sets up around the dead parts, and they become gradually separated. Such separation is known as sloughing. All lacerations partake of the character of contused wounds, as there is more or less bruising about the sides and edges. Gunshot wounds, being made by blunt bodies, are practically tubular contused wounds. They are very painful and likely to be accompanied by a deep-seated inflammation, as they usually contain foreign matter. Punctured wounds are those made by sharp-pointed instruments. If of any depth, they are dangerous, from the variety of tissues involved, and from the want of a free vent for any discharge that may be set up. Slight wounds may be rendered more serious by the introduction into them, either at or after the time of injury, of some poison or virus.

Burns are dangerous in proportion not so much to their depth as to the extent of surface involved. A burn covering half the surface of the body will result in death from shock; recovery is very rare if so much as one third of it is burned. Burns are sometimes classified as of three degrees: the first is a mere reddening, with slight swelling, owing to distention of the capillary blood-vessels. It is sometimes followed by desquamation of the cuticle. If the heat applied has been a little greater there will be a rapid flow of fluid out of the distended capillaries, and blisters will be formed containing serum, or serum mixed with blood. These may be raised immediately, or after a few hours. With a burn of the third degree the injury is still more severe, so as to destroy the vitality of the part. The gangrenous portion then gradually sloughs off, with free formation of pus, and the wound heals slowly by granulation. The cicatrix of a burn has a strong disposition to contract, and often produces great deformity. Severe burns are not infrequently complicated by inflammatory affections of the internal organs. The lungs and kidneys often become deranged in their action, and gastric disorders are common. Perforating ulcer of the duodenum occurs seldom earlier than the tenth day after injury.

Scalds are, in effect, similar to burns, and frost-bites are analogous. Of the latter there are two degrees, one in which vitality is merely suspended, the parts being white, stiff, and numb, and developing an inflammatory tendency upon return of the circulation; and a second degree, in which the vitality is completely destroyed, and gangrene supervenes upon thawing.

There are five modes described, by either of which a wound of the soft tissues may heal. 1. By *primary union*, where two cleanly-cut surfaces, brought into close contact, simply grow together, without suppuration. This is also called healing by first intention. Wounds of the perinæum and of the face and throat are most likely to heal in this manner. 2. When union by first intention does not take place, there may still be *primary adhesion*. A layer of lymph exudes, gluing together the surfaces of the wound, which then unite promptly. 3. In the process of *granulation*, the wound is gradually filled up to the surrounding level by new tissues, appearing in the form of small red, close-set granules bathed in pus. 4. In *secondary adhesion*, two granulating surfaces, brought together, unite. 5. *Under a scab*, where the effusion of lymph forms a thick film, under which the healing process goes on, the surface of the sore contracting and acquiring a new skin. It takes a cicatrix a long time to acquire the vitality of the original structure; sometimes, indeed, it never does.

For ordinary purposes it is, perhaps, sufficient to classify wounds as healing by first intention, or by granulation, without going further into detail. Destruction of the external tissues, attended by secretion of pus, is ulceration.

Granulations, if deficient, can be encouraged by stimulating applications, or be checked, if excessive, by astringents. Nitrate of silver is most often used for the latter purpose.

The healing of a granulating surface may be hastened by skin-grafting, which consists in placing upon it small portions of skin freshly cut from some part of the patient's or some other individual's body. If the operation is successful, each graft becomes a center around which cicatrization takes place, thus rapidly diminishing the size of the ulcer. The resulting cicatrix possesses more vitality, and is less liable to contract, than that which results from the ordinary healing process. In deep ulcers, prepared sponge is sometimes used for grafting. This is invaded by the granulations, and is subsequently absorbed. Antiseptic precautions must be taken in grafting.

The healing process is often hindered by inflammation, a series of changes in the blood and the tissues, resulting from irritation or specific poison, and manifested by heat, redness, swelling, pain, and suppuration. The swelling will be greatest and the pain least where there is the most loose tissue ; in a bony or fibrous tissue, inflammatory pain is very severe. Inflammation attacking a mucous membrane is of less importance than when a serous membrane, or solid part, is affected, as the matter can find its way to the surface by one of the natural outlets ; otherwise it is pent up in a cavity, or in the substance of some organ. An accumulation of pus in any of the tissues or organs of the body is an abscess. In opening an abscess the incision should always be made at the lowest point. If it is left to break spontaneously, the resulting scar will be larger than if it is cut. After an abscess is opened it is customary to poultice it till the discharge ceases to be purulent. When the pus manifests a tendency to work toward the surface, it is said to be "pointing." No wound should ever be allowed to heal at the surface first, as there will then be no outlet for the imprisoned matter, and it will "burrow" inwardly, doing further injury. Drainage tubes are used to keep wounds open until they heal from the bottom, and to carry off the pus. They are most often of rubber or glass, with holes in the sides, so that the pus may flow in from every direction.

Healthy or "laudable" pus is a thick, cream-colored, opaque discharge, smooth, slightly glutinous, and insoluble in water. The formation of pus is accompanied by pain and throbbing, and, if extensive, with fever, and sometimes chills or rigors. It is a steady drain upon the system, and a patient suffering from a suppurating wound needs to have his strength kept up by the most nourishing food.

Foreign matters in a wound, or retained and reabsorbed secretions, may give rise to general inflammatory fever. To prevent the retention and consequent decomposition of discharges, and to protect from external contamination, are the main points of the local hygiene of surgery.

The treatment of wounds consists in checking the hæmorrhage, removing foreign matters, bringing separated surfaces into apposition, and excluding the air by some dressing. Decomposed animal matter is one of the most virulent of poisons, and the smallest particle of it carried from one case to another may suffice to set up inflammatory action. Great care is needed to guard against this in a surgical ward. Two bad cases should not be put in adjoining beds, when it can by any possibility be avoided, and the proportion of suppurating wounds in the ward ought not to exceed one third. All instruments, scissors, forceps, etc., used about the dressing, even of a healthy wound, must be thoroughly cleaned before they are put away or used again. If oil or vaseline is required, do not allow fingers to be put into the common bottle, but take out a little, and throw away all that is left of it. The dressings taken from a wound must never be carried round from one bed to another, but removed from the room at once. Those which have been next the wound should be burned, not washed, and such as are to be washed must be first disinfected. Avoid soiling your own hands with dressings. Always have a basin in which to carry away the old ones, and do not use fingers where forceps will do as well. Do not go from one case to another without washing them in a disinfecting solution. Protect with a bit of plaster any place where the skin is broken, for you may get badly poisoned yourself through a slight scratch. If you find such a slight wound in washing your hands, pour a few drops of glacial acetic acid on the spot. It will bite, but it is a good preventive.

Before beginning a surgical dressing it is important to have at hand everything likely to be needed : it is awkward for yourself, and fatiguing to the patient, when you have to leave in the middle to find something that has been forgotten. Of course, when the doctor is to do the dressing, you can not always tell just what he will call for, but the things that you know will be wanting should always be ready ; and, after you have seen a dressing once, you should certainly know how to prepare for it again. A protector for the bed is wanted in every case; as also are towels, scissors, pins, and basins. Of these last mentioned there should be three; one to receive the discarded dressings, one containing fluid to wash the wound, and one to hold under it to catch the discharges. For the latter purpose the crescent-shaped basins are most convenient, as they fit closely to any part of the body.

Old dressings should never be pulled off forcibly. If they stick to the wound they should be irrigated until wet enough to come off easily. In removing adhesive plaster take hold of both ends, and make traction toward the wound from both directions evenly. It may be well to apply new strips of plaster between the old ones before taking them off, so that the wound can not be pulled open. Oil, ether, or turpentine will remove the traces of plaster. If obliged to leave a wound undressed, cover it with a *guard*, a piece of soft cloth dipped in the antiseptic used. Drain off the fluid from the soiled dressings before throwing them into the waste-pail, and take care that no instruments go in with them. Before fresh dressings are applied the wound must be washed with some antiseptic solution. Do not rub, but irrigate very gently until it is quite clean. It will seldom be necessary even to touch it. Dry around the edges with the softest lint. Very extensive wounds, as severe burns, are best dressed only a part at a time. Among the dressings in common use are carbolic and boracic acids, mercury in various forms—as the bichloride, the black and yellow washes—thymol, iodoform, cosmoline, oxide of zinc, balsam of Peru, etc. It is useless to give full directions for each, for new dressings are continually coming in vogue, and every surgeon has his own variations of the old ones. The object in nearly all of them is to exclude or purify the air, and to render aseptic everything coming in contact with the wound. This principle is most thoroughly exemplified in the Lister dressing. This is one of the most elaborate, yet, as it only needs to be renewed once in three or four days, it is perhaps no more trouble on the whole than a simpler one, which requires to be applied daily. The entire process is conducted under carbolic spray from a steam-atomizer. All sutures, ligatures, drainage-tubes, and protective used, are especially prepared, and kept in carbolic solutions until the moment of use. The instruments and hands of the operators are dipped in carbolic, 1–40, the wound itself is washed with it, and covered with "green protective." Over this are placed eight or ten thicknesses of carbolized gauze, extending at least eight inches beyond the wound in each direction. Between the last two layers is one of impervious mackintosh. The whole is confined with a carbolized gauze bandage.

Professor Lister says of this method of procedure that, when it is unsuccessful in keeping the wound free from putrefaction, we may feel assured that in some way there has been a failure to keep it uncontaminated. A "modified Lister" is without the spray.*

For the spray-lamp carbolic vapor is generally used, even when some other antiseptic is employed for the dressing, as it evaporates with steam more uniformly than any other.

The patient to be operated on should have a bath the night before, when sufficient notice is given, and on the morning of the operation-day a thorough enema. Only very light food should be taken, and, unless very feeble, the patient should fast entirely for three hours before etherization. In some cases a dose of brandy may be administered fifteen or twenty minutes previously. See that the patient passes urine the last thing before going to the operating-room, and save a specimen for examination. Have the hair well combed and tightly braided, so that it can not get loose and tangled. Artificial teeth must be taken out, and all tight bands loosened. Arrange the clothing so that it will be out of the way, well protected, and easy to change afterward if it should be necessary. Remove all dressings from the part to be operated upon, and cover it lightly.

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* Carbolized gauze is prepared according to the following formula: For 30 yards of gauze, take of resin 13⅓ ounces, of the crystals of carbolic acid 3⅓ ounces, of castor oil 2⅔ ounces, and of alcohol 2 quarts. Dissolve the resin and the oil in the alcohol, add the carbolic, and thoroughly impregnate the gauze with the mixture. Keep it moist.

Before any operation upon the female genitals, a hot douche should be given. If a T-bandage is needed, adjust it before etherization.

In a private house you will have to get the room ready as well as the patient. Have it thoroughly cleansed, well aired, and at a temperature of about 70° Fahr. There should be a long, firm table, on which the patient can lie, so placed that a strong light falls upon it, plenty of basins, clean towels, hot and cold water, soap, and a nail-brush, ice, pins, needles, scissors, sponges, vaseline, and carbolic acid. The doctor will tell you what else will be needed, and what dressings he wishes you to prepare. But these he will usually provide himself.

There is often a delay after everything is ready, for doctors are seldom prompt, though the nurse always must be. The hour or two which has sometimes to be spent in waiting for them is a most trying time for both patient and nurse. It is well to warn your patient that you are likely to have to wait.

The instruments, and as far as possible everything that is disagreeably suggestive, should be covered. In the hospital, the anæsthetic is given before the patient enters the operating theatre. Once there, the nurse has little to do but to wait on the doctor, and keep out of the way. Remember that, whatever your interest in the proceedings, you are present not as spectator, but as assistant, and keep on the lookout, not so much to see what the surgeon is doing, as what he is likely to want next. A second nurse will wash the sponges. They should be wrung out quite dry before they are handed to the surgeon. Count them both before and after the operation, and see that any missing ones are accounted for. This is most important in cases of laparotomy.

The following are the directions given for preparing new sponges for use after Keller's method.

1. After getting rid of sand by shaking and beating, they must be thoroughly washed in warm (not hot) water.

2. Soak in 1–1,000 solution of potass. permanganate for twenty-four hours. Solution to be renewed at end of twelve hours. Then wash in lukewarm water.

3. Bleach in 1–100 solution of sodii hyposulphite, to which a fifth part of an eight-per-cent solution of hydrochloric acid has been added. Stir with a stick for a few minutes only, until they are white. If left longer they become brittle.

After use, leave one day in running water, and free from coagula by washing in a saturated solution of sal-soda, or by leaving in such solution for a few hours. Then place in five-per-cent carbolic-acid solution (1–20) for fourteen days, renewing the solution once during that time. Very foul sponges are, however, most safely burned.

Too much emphasis can not be laid upon the necessity for absolute cleanliness in every way, both during and after the operation. Cleanliness, in its broadest sense, is the best antiseptic ; certainly none will take the place of it. Clean hands, and especially finger nails, are of literally vital importance.

At an operation in a private house, the nurse will be called upon to do a good many things which in a hospital fall to the lot of the junior surgeons, such as administering the anæsthetic. This will be ether or chloroform, or a mixture of the two. Ether may be poured, two or three drachms at a time, on a bunch of cotton inside a close cone of card or thick paper, made large enough to fit over the mouth and nose, the air being entirely shut out. It must be kept at a safe distance from the lamp, as it is inflammable and very volatile. The part of the face to be covered by the cone may be anointed with vaseline, to prevent its excoriation by the ether. Chloroform is not given in the same way, but sprinkled a few drops at a time on a handkerchief, and held at a distance of two or three inches from the patient's face, which it must never be allowed to touch. A mixture of atmospheric air is needed ; the proportion of chloroform inhaled should not exceed four per cent. Chloroform as an anæsthetic is more agreeable and more rapid than ether, and is less likely to nauseate, but it is more dangerous, as it has a powerfully depressant effect upon the heart. The head must be kept low, and the patient on no account be raised to a sitting position while under its influence. The signs of danger are a feeble pulse, a livid face, or extreme pallor, stertorous, or irregular and gasping respiration. If you are charged with giving the anæsthetic, do not try to do or see anything else at the same time; the patient requires undivided attention. Keep your finger on his pulse, and your eyes on his face, and at the first warning indications stop giving the vapor. If the dangerous symptoms continue, draw the tongue forward, so that it will not obstruct the trachea, admit fresh air freely, apply friction to the extremities, and resort if necessary to artificial respiration. No anæsthetic should ever be given except under the direction and in the presence of a medical man.

A properly made and protected bed should be all ready, to which the patient may be transferred as soon as the operation is over. He must be kept warm, and as quiet as possible, free from all excitement, and not allowed to sit up for any purpose. The nausea from the ether may be relieved by bits of cracked ice, or by very hot water, given in sips. After any operation about the stomach or bowels, the abdomen must be supported by the hand while vomiting continues. There is special danger of rupture in case of hernia, or ovariotomy. After an amputation the stump may be held in place by sand-bags to prevent its jumping. Following tracheotomy, there must be constant care to keep the tube free from mucus, and to prevent the access of cold air by a warm wet cloth over its mouth. This will need to be changed every five minutes. After any operation the strength needs to be kept up by nourishing food, but only in fluid form, until the doctor's permission is given to vary it. The wound must be so arranged that it can be observed without waking the patient, and, particularly during the first twenty-four hours, it must be carefully watched for secondary hæmorrhage. This may result from ineffectual ligation of the arteries, from washing away of the blood-clots by collateral branches, or from disease of the arterial coats. If it occurs later than the first twenty-four hours, it is most likely to be between eight and eighteen days, when the artery begins to slough.

After a severe operation or injury, a complete prostration of the nervous system not infrequently occurs, known as a state of shock. Loss of blood and debility favor shock. It may even be caused, in a feeble subject, by sudden strong emotion. The patient becomes pale, and faint or trembling, the mind confused or apathetic, the surface is covered with cold perspiration, there is often nausea, and sometimes relaxation of the sphincters, causing involuntary passages. It may result fatally, the patient sinking into collapse. Brandy and strong beef-tea should be given, and heat applied, especially to the extremities. A hot-air bath will sometimes be useful. The efforts to revive the patient must not be continued until they excite him, and he should not be allowed to make any effort himself.

If a surgical case escapes death from shock or hæmorrhage, there is still a third great danger to which he is liable—that of blood-poisoning. This most commonly takes the form either of erysipelas or pyæmia.

Erysipelas is most contagious, and any patient developing symptoms of it must be promptly isolated. It is most frequent in lacerated wounds, and those of the head and hands. It seldom occurs while active suppuration is going on. The secretions of the wound dry up, and the edges become red and swollen. In a day or two a blush appears about it, of a uniform red color, disappearing on pressure. There will be a high temperature, a quick pulse, headache, nausea, and a coated tongue. The disease may terminate favorably in from ten to fourteen days, but is often fatal.

Pyæmia is usually initiated with a chill, accompanied by a very high temperature, and followed by profuse perspiration. The secretions from the wound are arrested, the pulse is fast and feeble, the expression of the face anxious, the breath and body have a peculiar sweetish odor. The chills may recur at intervals of from twenty-four to forty-eight hours, but there is the greatest irregularity in their manifestations. The disease is usually fatal in from four to twelve days. Curative measures amount to little. Try to keep up the patient's strength, and to keep the fever down. Free ventilation and perfect cleanliness are of the utmost importance, the disease being most often occasioned by fault in this direction.

Septicæmia is a rather less dangerous form of blood-poisoning than the preceding. It occurs without the repeated chills, is characterized by a high, but more regular, fever, and a general typhoid condition. There is more probability of a favorable termination.

Tetanus is a usually fatal complication more often following slight wounds than severe ones. It most often results from exposure of the wound to cold. It is marked by a certain muscular rigidity, which sets in abruptly, beginning with the muscles of the throat and jaw, and gradually extending until the whole body is in continuous convulsions.

CHAPTER XVI.

Bones—Their number—uses—arrangement—composition—growth—diseases—Fractures—varieties—symptoms—Special fractures—The process of repair—The treatment of fractures—Splints, etc.—Plaster-of-Paris bandages—Starch—Water-glass—Fracture-box—Extensions—Handling fractured limbs—Dislocations—How distinguished from fractures—How reduced—Sprains—Anchylosis.

THE human skeleton is composed of more than two hundred different bones. These bones constitute the framework of the body, and serve to protect the delicate vital organs. There are three important cavities in the body, the skull, the chest, and the pelvis, each wholly or partly inclosed by bone, and held in position by the spinal column. This itself forms a canal containing the spinal cord, a continuation of the substance of the brain.

The skull is divided into two parts : the cranium, composed of eight, and the face of fourteen bones, besides those of the ears. The seams, or lines of union, of these bones are called *sutures ;* that between the two parietal bones is the *sagittal* suture, that connecting the parietals with the frontal is the *coronal* suture, that between the occipital and the parietals, the *lambdoidal*. These are the most important ones.

The head rests upon the first of the spinal vertebræ, which is called the atlas. The one next to this is the axis ; these two allow the movements of the head in every direction. The spine consists of thirty-three

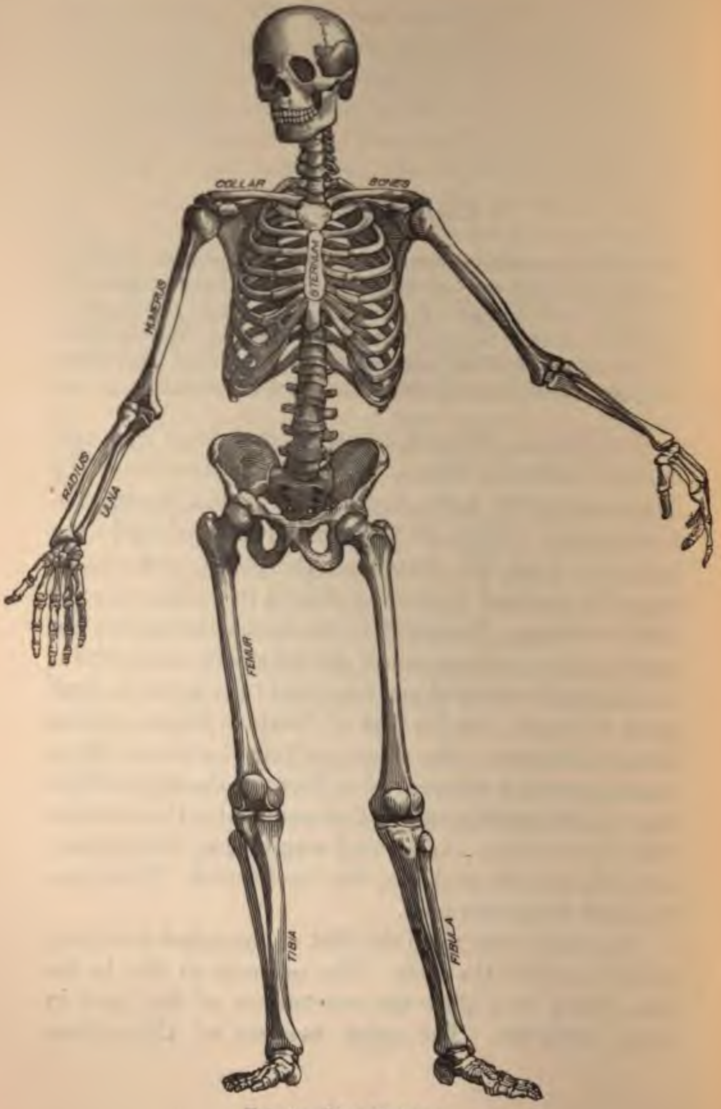

Fig. 9.—The Skeleton.

TABLE OF THE BONES.

Bones of Head.		Trunk.			Limbs.	
Cranium.	1 Frontal.	Spinal Column.	7 Cervical Vertebræ.		Upper Extremity, *each*	1 Clavicle.
	1 Occipital.		12 Dorsal Vertebræ.			1 Scapula.
	2 Parietals.		5 Lumbar Vertebræ.			1 Humerus.
	2 Temporals.		5 Sacral	Becoming fused in the adult.		1 Radius.
	1 Sphenoid.		4 Coccygeal			1 Ulna.
	1 Ethmoid.		1 Sternum.			8 Carpal.
Face.	2 Nasal.		1 Hyoid.			5 Metacarpal.
	2 Molar.		24 Ribs.	14 true. 10 false. 4 floating.		14 Phalanges.
	2 Lachrymal.	Os Innominatum (Hip-bone), *each*	1 Ilium.	Fused in adult.	Lower Extremity, *each*	1 Femur.
	2 Palate.		1 Ischium.			1 Patella.
	1 Vomer.		1 Pubes.			1 Tibia.
	2 Turbinated.					1 Fibula.
	2 Superior Maxillary.					7 Tarsal.
	1 Inferior Maxillary.					5 Metatarsal.
Ear, *each*	1 Malleus.					14 Phalanges.
	1 Incus.					
	1 Stapes.					

bones, called cervical, dorsal and lumbar vertebræ, according to the position which they occupy. Those of the different groups have differences also in shape by which they are recognizable.

From either side of the dorsal vertebræ spring twelve ribs, forming the framework of the thorax or chest. The first seven are connected in front with the sternum or breast bone, and are called true ribs; the lower five are distinguished as false ribs, three of them being connected only with the costal cartilages in front, and the last two having no attachment except to the vertebræ. These are termed floating ribs. At the lower extremity of the sternum is the ensiform cartilage. Joined to the upper end of the sternum in front, and to the scapula, or shoulder blade, in the back, is the clavicle or collar-bone; also, fitting into a cavity of the scapula, is the humerus, the largest bone of the arm. The upper arm has but this one bone; the forearm has two, the ulna and the radius. The ulna is the larger. It makes a perfect hinge-joint with the humerus. The two prominences at the elbow are called respectively the olecranon and the coronoid processes. The lower end of the ulna articulates with the radius but does not enter into the wrist-joint. This is formed by the lower and larger extremity of the radius, articulating with the eight small bones which make the carpus or wrist. Besides these there are in the hand five metacarpal bones, forming the palm, and fourteen phalanges, three in each finger, and two in the thumb.

The back of the pelvic wall is formed by the sacrum. This consists, in early life, of five distinct bones, which later become fused into one. The coccyx, the extreme end of the spinal column, is also formed by the union of four small bones. The remaining walls of the pelvic cavity are composed, on each side, of three bones, the ilium, ischium, and pubes, uniting in adult life into one, the os innominatum.

The lower extremity of the body has its bones arranged very much like those of the arm. The thigh bone or femur is the largest bone in the body. It has a round head, which fits into a cup-like cavity of the os innominatum, called the acetabulum; below this is a narrow neck, and two bony projections, the greater and less trochanters. The lower end of the femur articulates with the tibia, the larger bone of the leg. In front of the knee-joint is a thick triangular bone, the patella or knee-pan. Parallel with the tibia is a much smaller bone, the fibula. The foot has three divisions—the tarsus, having seven bones, the metatarsus, of five, and fourteen phalanges, arranged like those of the hand.

The skull contains the brain and organs of special sense; the thorax the organs of circulation and respiration, while the lower part of the trunk sustains those of digestion and reproduction.

The bones are composed of about two parts of mineral to one of animal matter. Lime is the main mineral, and gelatine the predominant animal constituent. Each bone is enveloped in a white fibrous membrane, known as the periosteum. This supplies nutrition to the bone. At the joints, or articulations, the bones are covered with a layer of smooth, somewhat elastic cartilage, and furnished with a serous membrane which secretes a lubricating fluid, the synovia. Bones increase in length by the ossification of these layers of cartilage—a new layer being deposited as the older one hardens into bone; this growth is more rapid at the lower ends of the bones. Similarly they increase in thickness, by the continual conversion of the periosteum into osseous structure. In youth the proportion of animal matter is greater than in advanced life; in old age the bones, lacking the gelatinous element, break more readily and take longer to unite. Like the other organs of the body, they are liable to various diseases and injuries. Softening of the bones—mollities ossium—results from an absence of the normal amount of mineral deposit. Periostitis—inflammation of the periosteum—occurs, usually associated with an inflammatory condition of the bone to which it belongs. Inflammation of the substance of the bone itself is known as osteitis. Caries is ulceration of bone; necrosis, death of the bone tissue in mass. This is most common in the shafts of the long bones. It is usually of traumatic origin, and always due to defective nutrition of the bone. Inflammation of the synovial membrane is called synovitis.*

Fractures are the most common injuries of bones. A simple fracture is one in which the bone only is divided. When there is also a wound of the soft parts, by which the broken bone communicates with the outer air, the fracture becomes compound. A flesh wound existing together with a fracture does not render it compound, unless it leads down to the seat of fracture. A multiple fracture is one in which the bone is broken in two or more places. A comminuted fracture is one in which the bone is broken into several small fragments at the same point. A comminuted fracture may be either simple or compound. A complicated fracture is one in which some joint or cavity is involved in the injury. An impacted fracture is where one end of the broken bone is driven forcibly into the other. In young children, whose bones are soft enough to bend, we get occasionally a partial fracture, of the convex side only, not extending through the bone. This is also called an incomplete or green-stick fracture. Fractures may be transverse, longitudinal, or oblique in direction; the majority are more or less oblique. A fracture is most serious when there is great injury of the soft tissues, or when a joint is involved. The nearer a large joint it occurs, the graver the prognosis. The signs of fracture are pain, distortion, loss of function, or unnatural mobility, and crepitus. Crepitus is the grating made by rubbing together the ends of the broken bone. It can not always be obtained, as the fracture may be impacted, or some portion of muscle intervene.

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* Note that the termination *itis* always means inflammation.

Some special fractures give special symptoms. A fractured spine is indicated by loss of sensation and power of motion below the point of injury, paralysis following in consequence of pressure upon or laceration of the spinal cord. Fracture of the spine above the fourth cervical vertebra, as a rule, causes instant death. With fractured ribs, the patient will complain of sharp pain when he takes a deep breath, or coughs, and will often spit blood. The danger from fracture of the ribs or sternum is of injury to the heart, lungs, or large blood-vessels by the broken ends. Fracture of the sternum is rare. Ecchymosis of the eye, or behind the ear, or the escape of blood through the ear, may be a symptom of fracture of the base of the skull. The patient may or may not be insensible. Fracture of the clavicle is one of the most common. Those known as Pott's and Colles's are also frequently met. Pott's fracture is of the lower end of the fibula, usually complicated with dislocation of the ankle-joint, and fracture of the inner malleolus. Colles's fracture is of the lower end of the radius, and results from falling upon the hand. Barton's fracture extends obliquely into the wrist-joint, occasioning more inflammation and greater impairment of motion than does the Colles.

The process of repair of broken bones is, although slower, essentially the same as that of the soft tissues. For the first two or three days after the injury, blood is effused around the broken ends. This is gradually reabsorbed; and during the second week a quantity of lymph is thrown out between and around the fragments which by degrees hardens, gluing them together. This new bone material is called callus; that between the broken ends intermediate callus, that surrounding them provisional callus. When the fragments can be maintained in complete apposition, there will be no provisional callus; it occurs only where there is mobility of the broken ends. You will always find it in the ribs, which can not be kept perfectly at rest; seldom in the patella, the olecranon or the cranium. After a fracture is solidly mended the provisional callus is reabsorbed. In four or five weeks, the callus will usually be hard enough to keep the bones in place, though it is not firm enough to leave unsupported under six or eight weeks, and only becomes converted into solid bone after the lapse of months. Small bones unite more quickly than large ones. Cartilage, once destroyed, is not repaired.

The treatment of fractures consists in putting the fragments in proper position, and keeping them there till the callus has had time to form and harden. For this purpose, splints are used, made of wood, tin, pasteboard, gutta-percha, leather, felt, or anything that will hold the bone accurately and firmly in place. A splint must be long enough to include both the joints between which the fracture is situated. It needs to be well padded, so that all prominences shall be protected from pressure. A gutta-percha splint is cut an inch larger in every direction than the size required, as it shrinks upon soaking in boiling water, in which it has to be immersed to soften it. It is then molded to fit the part, and left on until cold, when it will have hardened into the desired shape. It should afterward be lined with chamois-skin, and perforated all over, for ventilation. Sole-leather may be similarly softened and fitted. It does not interfere with the action of the skin so much as the gutta-percha.

In place of such splints are frequently used bandages saturated with starch, glue, or plaster of Paris, which harden in drying, and hold immovable the part to which they are applied.

Plaster-of-Paris bandages are prepared by rubbing into the ordinary coarse brown gauze and muslin rollers as much of the dry plaster as they will carry. They are then rerolled, and, if not to be at once used, kept in a tin box. Soft flannel bandages are first put on the broken limb, and over these, those containing the plaster, having been wrung out in water. The addition of salt to the water will cause the plaster to set more rapidly. It usually takes about twelve hours. Another way is to mix plaster of Paris with water to the consistence of thick cream, and dip in the mixture folds of sheet lint, or old soft cloths. Apply with a roller bandage. Starch bandages are put on in the same way; strips of wet pasteboard being included for greater firmness. Starch takes two or three days to dry thoroughly. A "water-glass" splint is made by saturating white gauze bandages with a solution of silicate of soda, and applying several layers of them. Those on the outside should be cut with a selvedge.

With either of these, the broken limb must be kept perfectly still until the bandages are firm. Sand-bags are used to keep them in position ; if they are heated it will hasten the drying. The bags should not be more than three quarters full, the sand fine and well dried, and the covering of texture close enough to keep it from sifting through. Chamois skin is an excellent material for this purpose. If a plaster splint is where it is likely to be soiled, it is well to brush over the surface, after it is dry, with Damar varnish, as it can then be washed. When a plaster splint is to be cut off, it will facilitate the process to moisten it with dilute hydrochloric acid along the proposed line of incision. It may be necessary also to cut openings for the escape of secretions from a wound, in which case the position should be accurately noted before the plaster is applied. But, for a compound fracture, a fracture-box is usually preferred, as the wound will be more accessible. It must be well padded with bran or jute. The sides of the box to which the limb is bandaged answer the purposes of a splint.

Before applying any apparatus, the part must be carefully washed and dried, and it is well to dust it over with fine starch or toilet-powder to absorb perspiration. A fractured limb is extended until its length, measured from fixed points, matches the corresponding one. If this extension can be kept up otherwise, splints will not be required. With Buck's extension, for thigh fracture, the leg is bandaged securely to a sliding frame, and kept in position by a heavy weight attached to the foot and leg by adhesive straps. The foot of the bed is elevated, so that the weight of the body affords counter-extension.

In lifting a broken limb support the parts both above and below the point of fracture, being careful neither to shorten nor twist it. By unskillful handling, a simple fracture may easily be converted into a compound and much more serious one.

A dislocation is displacement of one of the bony structures of a joint from the other. It may be, like a fracture, either simple or compound, or complicated with some other injury. The principal signs of dislocation are pain, impairment of motion, alteration in the length of the limb and in the direction of its axis. It is often difficult to distinguish it from a fracture. With a fracture only, crepitus may usually be obtained, the deformity is easily reduced, but returns as soon as the extension is discontinued, the pain continues after reduction, and the limb is never abnormally long. Where a dislocation exists alone, crepitus is rare, the deformity is not easily reducible, but when reduced is not likely to return at once, the pain is always relieved by reduction, and lengthening may exist. A dislocation is always accompanied by more or less laceration of the ligaments, and contusion of the adjacent soft tissues. Chloroform or ether is usually given to secure muscular relaxation, and reduction then effected either by gradual manipulation or forcible extension.

Laceration or stretching of the ligaments, with twisting of the joint, short of displacement, constitutes a sprain. Such an injury is very painful, and it often takes longer to recover from it than from a fracture. The tendency to inflammation is discouraged by entire rest, elevation of the sprained joint, and cold applications. When it is first used again, it is customary to support it by bandaging or strapping.

Abnormal rigidity of a joint, resulting from injury, disease, or disuse, is known as anchylosis.

CHAPTER XVII.

The uses of bandages—Rollers—The spiral bandage—The figure-of-eight—Ways of applying them—Many-tailed bandages—The triangular bandage—Slings—Elastic bandages—Strapping.

Bandages are used to fix dressings in place, to give support, apply pressure, or prevent motion. Those in general use are the roller, single or double, the many-tailed, and the triangular bandages. Roller bandages are strips of muslin or flannel, from half an inch to eight inches wide, and from three to twelve yards long, evenly and tightly rolled upon themselves. If made of any material that will not tear evenly, they must be cut by a thread, to insure regularity of width, and avoid fraying of the edges. The selvedge and all loose threads must be trimmed off. If a bandage is to be wet, it is best made of something that has been washed, or inconvenience may arise from its shrinkage. An old cotton sheet is good material. To piece the strips, lay the two ends flat on each other, overlapping for an inch, and baste together all four sides, leaving raw edges. They must be rolled as tightly as possible, either on a regular bandage roller, or by hand. A double-headed roller is made by rolling a bandage from both ends toward the center, or by basting together two single rollers.

To put on bandages neatly and well is a good deal of an art, and one for which no exact directions can be given. There are a few general principles to be borne in mind, and then adaptations are to be made in each case to the shape of the part over which the bandage is to be applied, and to the object in view. A well-fitting bandage must lie smoothly, without wrinkles, making an even and not too severe pressure. It must not be loose enough to slip, nor tight enough to be painful or to impede the circulation. A tight bandage can be loosened a little without removing it, by cutting half through each turn, but, if this does not give sufficient relief, it must be taken entirely off. Inexperienced bandagers are very apt to make them too tight, in the effort to avoid wrinkles.

In putting on a roller bandage, unwind no faster than is necessary, keeping the roll close to the body. In taking one off, roll or gather it up in the hand as fast as you unwind, keeping it in a compact form. For bandaging fingers and toes, a roller half or three quarters of an inch wide is used, for the hand an inch, for the head or arm two or two and a half inches, for the legs two and a half and three inches, and for the body six or eight.

Nearly all kinds of bandaging are variations and combinations of two simple forms, the *spiral* and the *figure-of-eight.* A simple spiral bandage goes round and round, each turn overlapping the one before it by one third its breadth. This can only be used over a nearly straight part. To accommodate it to the shape of a limb, reverses have to be made. This is done by placing a finger on the lower edge to hold it firmly, and turning the bandage downward over itself at an oblique angle. This brings it the other side out, and changes its direction. These turns can be made as often as needed, whenever the bandage will not otherwise fit smoothly. They should not be made over a prominence of bone, but are best at the back or on the outer side of the limb. The figure-of-eight bandage is more generally used than the spiral, as it fits better, and is, when familiar, more easy of application. It is especially well adapted for carrying a bandage past a joint. It is applied alternately above and below the joint, or some central point, the roll being carried obliquely over it. As in the spiral, each turn covers two thirds of the preceding. The angles where the folds cross should be equidistant, and should succeed each other in a straight line. The figure-of-eight needs fewer reverses than the spiral bandage, but they are to be employed as occasion requires. The spiral and the figure-of-eight may be used singly or in combination.

In bandaging any limb, begin always at the extremity, and work toward the center of the body from left to right. Hold the roller with the outer side next the limb, until reverses are called for.

To cover a foot, start the free end of the bandage at the instep, and make a turn around the base of the toes. Then carry the bandage diagonally over the foot, across the point of the heel, and back from the other side till it coincides with the first turn. Cover this, and carry a second turn around the heel, half an inch higher than the first: continue to make alternate turns under the sole and behind the heel, crossing over the instep, until the entire foot is covered. Finish with a couple of circular turns around the ankle, or continue up the leg.

In finishing off a bandage, make one or two straight turns, fold under the end and pin it, or split the last quarter of a yard through the middle, wind the ends in opposite directions around the limb, and tie them in a bow. A bandage to cover the groin is commenced with two turns about the thigh; the roller is then carried diagonally to the opposite hip, round the waist, and downward, crossing the first oblique fold in front of the thigh. Another turn about the thigh follows in the same direction as the first, and the same course is repeated, leaving proper spaces, and making a series of figures-of-eight, till the bandage is carried sufficiently far. A bandage of this form, a figure-of-eight which includes two distinct parts of the body, is called a spica. This may be used either by itself or as a continuation of the leg bandage.

To bandage a hand, begin at the tip of the first finger, and cover it by a succession of close spirals or figures-of-eight to its base. Then make a turn around the wrist to keep these from slipping, and return to the root of the second finger. Lead the bandage by one or two spirals to the tip of this, and then proceed down it, as upon the first finger, concluding with another turn about the wrist. Cover each finger successively in the same way. Then take a slightly wider bandage, start it at the back of the hand, and wind it around the base of the fingers. Carry it obliquely across the back of the hand, around the wrist, back to the further side, and again around the palm. Continue these turns alternately till you have a line of crosses straight down the back of the hand, and the palm is completely covered. The thumb is finally to be dressed by making alternate turns over it and around the wrist. This is sometimes called the spica for the thumb. Before covering the palm of the hand, put a little absorbing cotton in it. Do the same at the flexures of any large joint that is to be covered by a bandage, to make it fit better, to absorb perspiration, and prevent chafing. This is especially important at the axilla.

A spica for the shoulder may be put on in much the same way as that for the thigh, beginning with one or two turns around the arm, carrying the bandage over the point of the shoulder, across the back, under the other arm, and over the chest to the shoulder again. Make another turn about the arm, and repeat three or four times, as required.

A double spica for the shoulders, which includes the entire chest, is commenced like the single spica, but the second turn across the back, instead of following in the line of the first, is carried down at a sharper angle, and brought around the waist. It is then carried again diagonally up the back to the opposite shoulder. Make two or three turns about this arm, as previously around the other, then carry the bandage down across the chest, around the waist, and up across the chest again to the shoulder from which it started. Wind it again about the arm, carry it obliquely down the back, around the waist, etc., leaving the usual spaces, and following the direction of the previous turns, till the entire chest is covered. There should then be a line of crosses in the center of the front, in the back, and down each shoulder.

An admirable bandage for the arm and shoulder, in case of clavicle fracture, devised by Dr. C. H. Wilkin, of New York, is applied as follows: Place the arm of the injured side on the opposite breast. Start the bandage in the middle of the back, between the shoulder-blades, and bring it over the well shoulder down to the outside of the injured arm just above the elbow. Then bring it under the elbow, leaving the tip exposed, and up over the injured shoulder to the starting-point, where it is pinned to the first end of the roller. Continue downward across the back, and round the body in a straight line, over the injured arm, just above the elbow-tip. Carry it round twice in the same place, and the second time cross the back upward to the well shoulder, and down again to the outside of the injured arm, and around the elbow as before, leaving the proper spaces.

Firm and even pressure can be made upon the breasts by a single broad band passing around them, the spaces between and at either side being first filled to a level with cotton.

Among the many head bandages, a useful one for retaining dressings upon the scalp is the hood, or Capelline bandage. This is put on by a double roller, one end of which needs to be a third larger than the other. Stand behind the patient, and taking the smaller roll in the right, and the other in the left hand, begin low on the forehead and carry them round the head as far down on the occiput as possible. Then transfer the bandage in the left hand to the right, and continue it round, while the other is folded over at right angles with it, and brought across the top of the head to the front in the left hand. Here it meets the other and crosses it, again running backward, and overlapping the former folds. These turns are continued until the whole head is covered, one bandage going round and round it, and the other back and forth across it. All the folds leading from the front of the head to the back should be on the left of the middle, while those leading toward the front should be on the right. Finish with one or two extra circular turns. The head may be partially or entirely covered by a single roller, making alternately circular and oblique turns, and pinned at the angles.

To bandage a stump after amputation, either a single or a double roller may be used in much the same way as in bandaging the head, beginning at some distance from the end, making turns back and forth over it, and holding them firmly by circular ones.

When it is important to avoid motion of the part to be covered, a "many-tailed" bandage may be used. This consists of a piece of muslin torn into strips from each side to within an inch or two of the center, which is left entire. Apply this to the back of the limb, and, beginning at the bottom, fold the strips from either side alternately around it, giving them an upward direction, and making them cross each other in front. The bandage of Scultetus is an improvement upon this. To prepare it, take a strip the length of the part to be bandaged, and sew across it at right angles other strips overlapping each other by two thirds their width. Without turning this round, lay it on a board, to keep it smooth, and slide it under the limb; begin at the bottom, and fold the strips one after another in a slanting direction over it. The strips from opposite sides should cross in front and go half way round again. This bandage can be applied with very little disturbance to the patient, the limb having only to be slightly lifted to slip the board under, and again to remove it. The following form may be used after ovariotomy and other abdominal operations. Take seven strips of flannel, each four inches wide, and one yard and a quarter long. Place two of these lengthwise on a table at a distance of six inches apart. Sew the other five across them, beginning at the top and allowing each to overlap the one above it by one half. Pass the bandage under the body, fold the cross strips over the abdomen from below upward, then bring the free ends of the vertical strips between the thighs, and pin them, one on each side, to the front. These will keep the bandage from slipping up or wrinkling under the back.

This arrangement has the advantage of allowing the wound to be dressed without moving the patient. It is sometimes use as a substitute for the ordinary binder after confinement. Other modifications of the many-tailed bandage are made to fit different parts of the body.

The T bandage is constructed on the same plan, but consists of two pieces only, at right angles to each other. Its chief use is to retain dressings upon the perinæum.

A four-tailed bandage is made by splitting a strip of cloth at each end to within a few inches of the center. Such a one may be used to keep dressings on or give slight support to the knee. Place the center over the patella, carry the tails under the knee, cross them so that the lower ones will come above the joint, and the others below, bring them round, and tie in front, two above and two below the knee.

For the jaw, take a strip a yard long and three inches wide, make a slit of three inches in the center, and split the ends to within two inches of it. Let the chin rest in this slit, carry the two lower halves up in front of the ears, and tie them together on top of the head, while the upper ends are carried back below the ears and tied together behind. Finally, bring these ends vertically upward, and knot them again into the corresponding ones from above.

These are only a few of the many ways in which the roller and the many-tailed bandages may be used. The triangular bandage can also be applied in more than thirty different forms, and can anywhere be provided by folding or cutting a large handkerchief diagonally. On the head, it forms the covering known as a shawl cap. Place the center in the middle of the forehead, let the ends cross low down at the back of the head, catching in the apex of the triangle, and bring them round again to be tied in front. In an exactly similar way it may be used to retain the dressing on a stump. To keep dressings in the axilla, fold over the rectangular corner of the triangle, place the center under the arm, cross the ends over the shoulder above, and bring them down one across the chest and one across the back, to be tied together under the opposite arm.

It may be applied as a sling to the upper extremity in three ways. If the forearm is injured, its whole extent should be supported equally, including the elbow. Carry the outer end of the sling around the neck, on the side to which the injured arm belongs, and the end between the hand and the chest around the other side, tying them at the back. If the injury is of the upper arm, the sling should support the wrist only, making no pressure on the elbow. Turn the hand with the palm toward the chest, and support it higher than the elbow. Cross the ends in the opposite direction from that above described. With a fractured clavicle or scapula, the front of the sling should bind the elbow well forward, and cover the hand, crossing upon the opposite shoulder the other end, brought up obliquely across the back, and tied with it under the sound arm. A foot may be slung by a wide bandage passing around the neck.

Rubber bandages are most used to reduce or prevent swelling. They should be put on without reverses, and special care is needed to avoid getting them too tight. Elastic stockings are used for the same purpose, usually in case of varicose veins.

Another means of affording support, or protection, to a limb, or other part, is by strapping. Soap plaster is to be preferred to the ordinary adhesive. Cut in the direction of the selvage, which must be taken off. Warm by holding the plain side over the flame of a spirit lamp, or on a bottle of hot water. If it is to be applied over a very uneven surface, immerse it in hot water and press it gently on with a cloth. For strapping a leg, cut the strips an inch and a half wide, and long enough to lap over six inches after passing around the limb. The hair should first be shaved off. Stand in front of the patient, and apply the middle of the strap to the back of the leg ; bring the ends around and cross them in front, giving them an upward direction, like the sections of a many-tailed bandage. The next strip is put on a little higher, overlapping the first by a third, and so on, as far as required. It needs to be renewed daily. For joints, the strapping should extend for some distance above and below, and the plaster is best spread on leather.

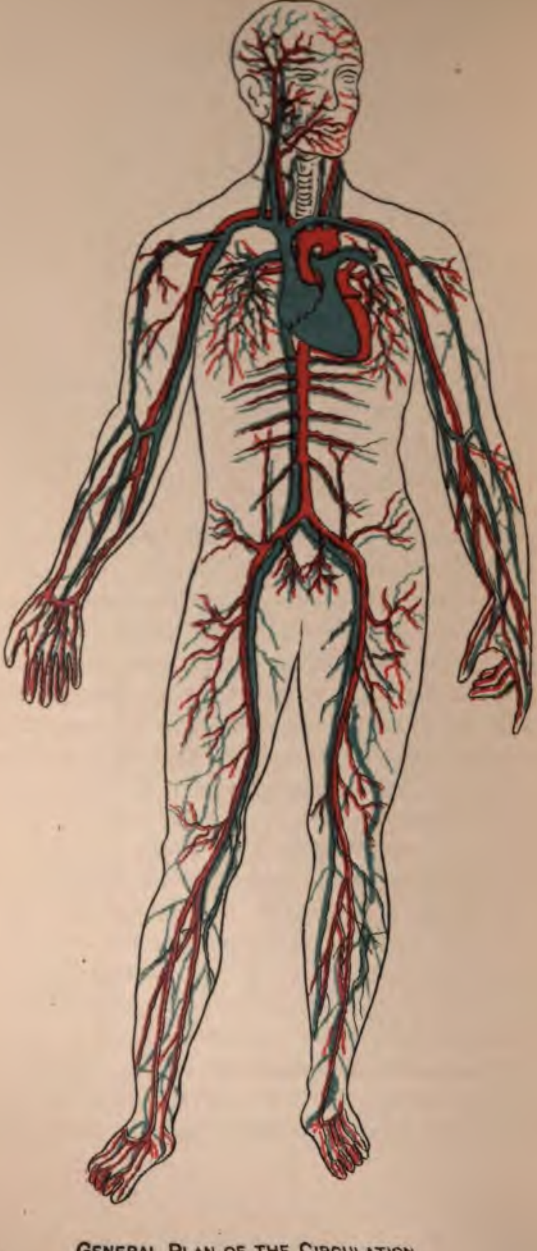
In case of fractured ribs, or whenever it is desired to limit the movements of the chest, strapping is sometimes employed in place of bandaging. It has an advantage in that it can be applied to one side alone.

CHAPTER XVIII.

Hæmorrhage—Different kinds—Causes—Amount—Natural tendency to arrest—Artificial modes of controlling arterial hæmorrhage: by cold—position—pressure—styptics—the cautery—ligation—torsion—acupressure—Venous hæmorrhage—capillary—Constitutional symptoms—Internal hæmorrhage—Hæmoptysis—Hæmatemesis—Hæmaturia—Uterine hæmorrhage—Epistaxis.

The escape of blood from its containing vessels is hæmorrhage. According to the kind of vessel ruptured, it may be described as arterial, venous, or capillary hæmorrhage. It is usually easy to distinguish these. Blood from an artery will be of a bright-red color, and will spurt out in jets of considerable force from the side of the wound nearest the heart. The jets will correspond to the beats of the heart, not entirely intermitting, but subsiding into a steady flow between them. Venous blood is of a dark-purplish hue, and moves in a sluggish continuous flow, mainly from the side furthest from the heart. Capillary hæmorrhage is a mere oozing of blood. The first is by far the most dangerous. Hæmorrhage from a large artery, if not promptly checked, may prove fatal in a few moments.

All wounds are attended by more or less bleeding. Besides such, described as traumatic, there may be hæmorrhage caused by rupture of the blood-vessels, either from disease of their coats, or of surrounding parts. Hæmorrhage following shortly after an opera-



GENERAL PLAN OF THE CIRCULATION.

CHART OF MAIN ARTERIES.

- AORTA.
  - Arch.
    - R. Coronary.
    - L. Coronary.
      - Supply walls of heart.
    - L. C. Carotid. . . . .
    - Innominata.
      - R. C. Carotid.
        - Internal Carotid—supplies brain.
        - External Carotid—supplies face and skull.
      - R. Subclavian.
    - L. Subclavian. . . . .
      - Axillary—brachial
        - ulnar
        - radial
          - Palmar arch and digitals.
  - Thoracic.
    - Phrenic—supplies diaphragm.
    - Intercostal (10).
    - Cœliac Axis.
      - Gastric.
      - Splenic.
      - Hepatic.
    - Superior Mesenteric.
    - Inferior Mesenteric.
    - Renal.
  - Abdominal.
    - R. C. Iliac.
    - L. C. Iliac.
      - External Iliac—femoral—popliteal.
        - anterior tibial—dorsalis pedis.
        - posterior tibial.
          - external plantar.
          - internal plantar.
            - Plantar arch and toes
      - Internal Iliac—supplies pelvic viscera.
    - Lumbar.

tion, when it has been once completely checked, is known as secondary. It arises either from giving way of the ligatures, or from the extension of sloughing to parts not previously implicated.

The amount of bleeding from a wound depends not only upon the kind and size of the cut vessels, but upon the manner in which they are divided. A wound crossing an artery will occasion more severe hæmorrhage than a longitudinal one, an incised wound more than one contused or lacerated, and a mere puncture more than a completely severed artery.

The arteries are always in a state of tension, and, when cut, the edges retract from each other, and contract upon themselves, so lessening their caliber. The outlets are choked by the coagulating blood, and, when there is much loss of blood, fainting ensues, the action of the heart becomes slower, and less blood is sent to the wounded part. In these three ways Nature tries to arrest hæmorrhage, and moderate bleeding will soon be checked spontaneously when the blood is in a normal condition.

The application of heat or cold favors the formation of clots and the arterial contraction ; elevation of the injured part reduces the force with which the blood is sent to it ; these will often be the only treatment required, but in more severe cases, when blood is spurting from a wounded artery, further measures become necessary.

The most important of these, and one usually calling for no further apparatus than one's own fingers, is pressure upon the bleeding point, or the vessels which supply it. There is no danger of serious hæmorrhage from a wound to which forcible digital pressure can be applied. If the bleeding vessel is too deep to be reached by the finger, the wound can be plugged by a compress of lint. To make this most effectively, cut a number

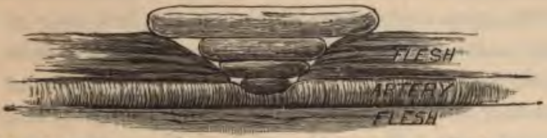


FIG. 10.—Direct compression of a wound by means of what surgeons call a graduated compress, made of pads of lint, folded in different sizes, with the largest one on top.

of small bits, each a little larger than the preceding, and, beginning with the smallest, press them well into the wound. The pile should extend to some little height above the surrounding level, and be secured by a tight bandage. Such compression can only be made successfully over a bony surface; where the artery is imbedded in muscle, it becomes difficult if not impossible to control it. Wounds of the head and face, though they are apt to bleed profusely, can almost always be controlled by direct pressure, as the skull affords firm counter-pressure. If the bleeding artery can not be reached in this way, it, or the branches leading to it, must be compressed at some point nearer the source of supply. Thus, bleeding from a finger or toe can be stopped by making pressure on both sides of it, above the wounded point. So, in any case, firm compression of the bleeding vessel between the wound and the heart will arrest the flow of blood. In order to be able properly and promptly to apply such pressure in time of need, every nurse should familiarize herself practically with the course of the main arteries, know where to find them and how to control them. Actual experiment is the only way of rendering the information of much utility.

The aorta, the main trunk of the arteries, ascends from the upper part of the left ventricle for a short distance, then forms an arch backward over the root of the left lung, and descending upon the left side of the spinal column passes through the diaphragm into the abdomen. It is known in its different parts as the ascending and descending arch, the thoracic and abdominal aorta. From the arch of the aorta arise five branches: the arteria innominata, the right and left coronary arteries, the left common carotid, and the left subclavian. Of these the innominata is the largest. It extends for only about two inches, and then divides into the right common carotid and right subclavian. The common carotids run up each side of the neck, and divide into the external and internal carotids, the one with its branches supplying with blood the face and outside of the skull, and the other penetrating to the brain, through an opening in the temporal bone. The coronary arteries return and supply the walls of the heart.

Each of the subclavians runs along a groove in the first rib, and it is against this that pressure is made to control the circulation in the shoulder and arm. It turns downward over this rib, and takes the name of axillary for a short distance, and then brachial. The brachial proceeds down the arm along the inner border of the biceps muscle to the front of the elbow, just below which it divides into the radial and ulnar arteries, which continue down the arm, one on each side, to the hand. In the hand, they and their branches reunite into a semicircle called the palmar arch. From this small arteries are sent off to each of the fingers. All these can be traced back to their origin at the arch of the aorta.

The aorta reaches as high as the third dorsal vertebra, then descending passes through the diaphragm at about the level of the twelfth dorsal. Opposite the fourth lumbar vertebra it divides into the right and left primitive or common iliac arteries. These are about two inches long. They diverge outward and downward, and, opposite the fifth lumbar vertebra and the sacrum, divide into the external and internal iliacs. The internal iliacs, after a course of about an inch and a half, are split up into numerous branches supplying the pelvic viscera.

Each external iliac continues downward and outward along the brim of the pelvis, and half-way between the anterior spine of the ilium and the symphysis pubis, runs under Poupart's ligament, and takes the name of femoral. The pulsations in this can be distinctly felt at the groin. It descends along the inner side of the thigh in a nearly straight line till it reaches the lower third, where it again changes its name and its direction, becoming the popliteal, and passing to the back of the thigh and down behind the knee. Here it divides into the anterior and posterior tibials, which run down either side of the leg, and finally anastomose into the plantar arch, as do the ulnar and radial arteries into the palmar. From the plantar arch, branches go to the toes.

The other principal branches of the descending aorta are the intercostals, the phrenic artery, the cœliac axis, and the superior and inferior mesenterics. These supply various internal organs.

The arteries most commonly compressed for the relief of hæmorrhage are the subclavian, the brachial, and the femoral. You should at least know how to find and manage these. If pressure can not be made forcibly enough by the fingers, or if it needs to be maintained for any length of time, a tourniquet can be used upon the brachial or femoral arteries. Before applying it, elevate the limb as high as possible, make a few turns of bandage about it to protect the skin, and place a hard pad directly over the course of the artery. In the absence of the regular apparatus, an impromptu tourniquet may be made of a handkerchief or strip of muslin, with a hard knot or a smooth stone tied in the middle. Fasten this rather loosely around the limb and twist it with a stick, keeping the knot over the injured artery until pressure enough is made to completely occlude it. This is sometimes called a field tourniquet. It will be of no use whatever unless so fixed as to make pressure directly upon the main trunk of the artery. A tourniquet may remain on the arm for an hour, on the thigh for two hours, not more, as the part will die if its nutrition is cut off too long.

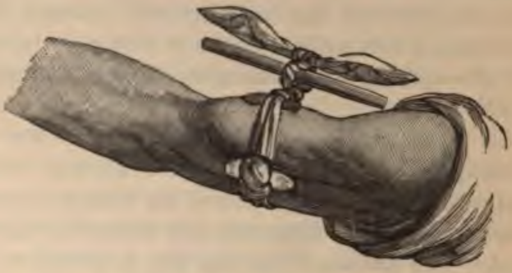


FIG. 11.—Manner of compressing an artery with a handkerchief and stick.

The subclavian artery can not be reached by a tourniquet. The handle of a large key or a blunt stick, suitably covered, may be pressed forcibly against it, behind the clavicle at the outer third of the first rib, in case of severe hæmorrhage from the shoulder or axilla.

Esmarch's plan for preventing hæmorrhage, during an operation upon a limb, is to apply a very tight rubber bandage spirally from its extremity to a point above the site of the proposed incision. Where this stops, a piece of rubber tubing, with hooks at the end, is wound several times tightly around the limb and fastened. The bandage is then removed, when the circulation will be found to be almost completely cut off.

Flexion of a limb will sometimes be of aid in arresting hæmorrhage. Put in the joint a firm roll of lint against which the pressure will come when the limb is bent. In case of bleeding from the palm of the hand, which will sometimes be profuse, direct the patient to clasp closely a wad of lint, at the same time holding the hand high above the head.

With a secondary hæmorrhage, the first thing to be done is to remove all dressings so as to expose the wound to the air. Make digital pressure upon the wound, if it can be reached, assisted by pressure on the main artery, and notify the surgeon at once.

Besides those named—heat or cold, position, and pressure—there is still another means of arresting hæmorrhage to which a nurse may, in an extremity, resort—namely, use of astringents. Astringents used externally are called styptics. The most useful are the subsulphate or the perchloride of iron, alum, gallic acid, and matico. Wring out a piece of lint in the dilute solution, and, having first wiped out the blood-clots, stuff it into the wound. The mode of action is by increasing the contractile power of the vessels. Nitrate of silver or lunar caustic acts somewhat similarly. Obstinate bleeding from a small point, as a leech-bite, may be checked by touching with this. Lunar caustic is sometimes spoken of as the potential cautery, having the effect, though more superficially, of cauterization.

The actual cautery—the application to the wound of a hot iron—is sometimes employed by surgeons, when the bleeding is from many vessels over a large surface, or from a porous part which will not hold a ligature. Both styptics and the cautery prevent primary union, and are only employed when no other means will answer.

The method most commonly used by surgeons for the arrest of hæmorrhage from an artery of any size is ligation. The artery is picked up by a pair of forceps, and a ligature tied firmly about it. A ligature should be about eighteen inches long. It is most often made of strong, soft silk, though catgut or wire is sometimes used. Test its strength well, so as to leave no chance of its breaking when strained; and, if you have it to tie, be sure and make a firm knot. Surgeons use

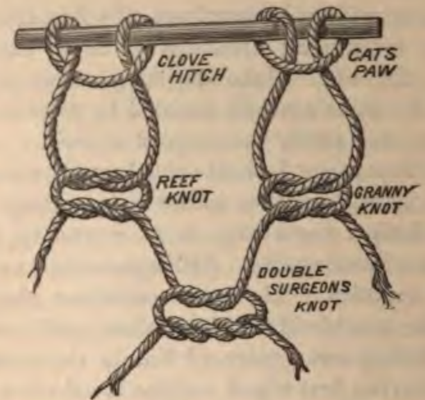


FIG. 12.

generally the "reef knot," a square knot in which both ends of one string pass either over or under the loop made by the other; if the ends are separated by the loop, you get a "granny" knot, which will slip. The string in the right hand should be held over the other in the first twist, and under it in the second, or *vice versa*. This knot may be made additionally secure by making the second turn twice instead of once, before drawing it tight. You should practice these knots, and also the "clove hitch," which is often called for. For this, make two loops in the cord from right to left, and put the first over the second. Loops in opposite directions will make, if they hitch at all, the much less reliable "cat's paw."

Another mode of arresting hæmorrhage, frequently employed, is that of torsion, the artery being seized in the forceps and twisted, rendering a ligature unnecessary.

Still another way, though now rarely adopted, is by acupressure; a harelip pin is placed about the open mouth of the vessel, and a wire twisted over it in the shape of a figure 8.

There are then nine methods of arresting arterial hæmorrhage: five—cold, heat, position, pressure, and styptics—which the nurse may employ at discretion; and four others—cauterization, ligation, torsion, and acupressure—which belong exclusively to the surgeon.

The most dangerous form of venous hæmorrhage is that from rupture of large varicose veins. Pressure should be made *below* the bleeding point, cold or heat applied, and the limb elevated. Pressure above the point of injury is here useless and absurd. Ligation is avoided, as it is likely to occasion inflammation of the vein. In cases where there is danger of such rupture, an elastic stocking or bandage should be worn to support and make equable pressure upon the distended vessel. This should be put on before getting up in the morning.

Capillary hæmorrhage is never dangerous, and can easily be checked by cold and position, or by hot water, an especially valuable hæmostatic in such cases. It must be used as hot as it can be borne. Warm water will only increase the flow of blood.

There are some persons who have what is called the hæmorrhagic diathesis, that is, an excessive tendency to bleed, so that even a slight cut or scratch may be followed by hæmorrhage difficult to control. If such a case comes into your hands, you will probably have to resort to styptics. To stop the bleeding after a tooth has been extracted, a good application is a little piece of burnt alum pressed well into the cavity, and packed down with lint.

The constitutional symptoms of extreme hæmorrhage are pallor, coldness of the extremities, clammy sweat, feeble or sighing respiration, small and rapid pulse, restlessness and thirst, vertigo, dimness of vision, ringing in the ears, difficulty in articulation, followed, if the trouble is not before this brought to an end, by unconsciousness, slight convulsive movements, and death. The hæmorrhage usually ceases, or is much lessened, with syncope.

The same effects follow internal hæmorrhage, and may be the only evidence of its existence, though usually the blood will somewhere find an outlet.

If blood comes from the lungs, *hæmoptysis,* it is usually coughed up, is bright red, and more or less frothy from the admixture of air. It is always a serious symptom, though the quantity of blood lost is rarely great, but blood supposed to be from the lungs is not infrequently from the mouth or throat.

The vomiting of blood, *hæmatemesis*, is usually somewhat less ominous. The patient is likely to have a sense of fullness and oppression in the epigastric region, and then to throw up, without much nausea, a large quantity of dark blood, mixed with food, but containing no air, acid in reaction and incoagulable.

In either case, keep the patient quiet and cool, the head elevated. Give bits of ice, having them swallowed whole if possible, and, if the hæmorrhage is repeated, apply ice-cold cloths externally. Give only fluid food, cold and in small quantities.

In cases of internal hæmorrhage, particularly from lungs, much may be done to arrest it by partially cutting off the venous return from the limbs by means of straps, or bandages, applied tightly around their proximal extremities. This procedure, by diminishing temporarily the amount of blood in the circulation, will diminish its force, and give an opportunity for coagula to form in the bleeding vessels. If the hæmorrhage ceases, the constricting bands should be gradually loosened and removed, but left ready to be instantly re-applied on any re-appearance of it.

When an exhausting hæmorrhage has occurred, after its source has been controlled, the limbs may be tightly bandaged from their distal extremities to the trunk, in order to prevent the circulation in them of blood which is needed by the vital organs. The object in both above procedures is to gain time.

With hæmatemesis some blood will almost invariably appear in the next defecation as a dark, tarry substance. For hæmorrhage from the bowels, ice-cold injections may be given, and in the same way solutions of vegetable astringents—as oak-bark, tannic acid, catechu, etc. Make cold applications over the abdomen. It may be well to give a small dose of opium to diminish the peristaltic action. This may occur in the course of typhoid or yellow fever, but is more common from hæmorrhoids than any other cause.

With *hæmaturia*, keep the patient lying down, and give hot or ice-cold injections into the rectum or vagina. Blood in the urine may come either from the kidneys, bladder, or urethra. Note whether it appears at the beginning or end of micturition, and whether its passage is accompanied by pain.

In case of uterine hæmorrhage, especially when following operations, a vaginal douche of hot water, or a hot solution of alum, is especially indicated. The fluid extract of ergot, or gallic acid, may be given internally. It may be necessary to plug the vagina. One way of doing this is to introduce, as far as the mouth of the uterus, the center of a soft handkerchief, leaving the ends projecting. Pack this with small pieces of compressed sponge, or absorbing cotton, and tie the projecting ends together. The sponge is the better thing to use, for, as it becomes saturated, it will swell, making considerable pressure. After a sufficient time the plugs can be removed, one at a time, and, finally, the handkerchief. Another way is by means of a kite-tail tampon—a series of bunches of absorbing cotton, tied at intervals of a couple of inches along one string. These are introduced, one at a time, till the vagina is distended, and the end of string left hanging. Upon pulling this, the plugs easily come out in succession. Hæmorrhage following childbirth is called *post-partum*. Special directions for its treatment are given in the chapter upon obstetrics.

There is one other local hæmorrhage which demands some special attention: epistaxis, bleeding from the nose. This may be either the result of an accident or a spontaneous outbreak. In the latter case it may be regarded as an effort of nature to relieve the head, and need seldom be regarded with any uneasiness. To check it, make pressure on the facial artery at the root of the nose, and make cold applications to the forehead and back of the neck. The ordinary position taken—leaning over a basin—is the worst possible. Make the patient stand erect, throw his head back, and elevate his arms, while you hold a cold, damp sponge to the nostrils. If the bleeding still persists beyond a reasonable time, gallic acid may be snuffed up, or the nostrils syringed with salt and water, ice cold (ʒ j–Oj). There are very few cases that these measures will not control. Avoid blowing the nose, and so disturbing the forming clots. If all other means fail, the surgeon may find it necessary to plug the nares. To do this, he will need a small flexible catheter, a strong cord, and some lint. The cord is passed through the eye of the catheter, and carried by it through the nostril to the pharynx, where the end of the string can be caught and brought out through the mouth. By means of this a plug of lint is drawn into the posterior naris; another is pushed into the anterior, and the two tied together so as to hold each other in place. They should be left in for twenty-four hours. The process is a very painful one, and only resorted to when all other means prove ineffectual.

CHAPTER XIX.

Emergencies—General conduct in accidents—Shock—Syncope—Fractures—Dislocations—Sprains—Wounds—Bites and stings—What to do in case of fire—Burns—Foreign bodies in the eye—ear—nose—throat—Asphyxia—Artificial respiration—Sunstroke—Lightning—Freezing—Convulsions—Apoplexy—Other causes of insensibility—Poisons.

Some exceptional cases will arise, in which whatever is to be done must be done at once, without waiting for the arrival of skilled service, and in these emergencies, if a nurse is present, she will naturally be looked to in the place of a doctor. Just how much the nurse is justified in doing, it is difficult to say; it depends upon the case, and upon the nurse. You will not wish to assume responsibilities that do not belong to you, but, when a doctor can not be at once obtained, prompt action on your part may save life. Do not try intricate experiments; remember that the simplest things are often the most useful, and that it is usually safer to do too little than too much. As a rule, if you do not feel sure what ought to be done, do nothing. But, if you have made any use of your opportunities, you will know, at least, more than the utterly uninstructed crowd. Now is a chance to practice the coolness and presence of mind which your training has led you to cultivate. Above all things do not get excited, or you will forget all that you would otherwise know.

In case of any accident, send a message to the doctor, describing as well as you can the nature and urgency of the case, so that he may come prepared with the necessary appliances; try to get rid of everybody who can not be made useful, so as to secure plenty of fresh air and room to work. If respiration is suspended, or the danger imminent, treatment must be begun at once, on the spot, without loss of time, otherwise the patient may be carried to the nearest convenient house. For this purpose, a stretcher, or something which will take its place, on which he can lie horizontally, should be provided. The bearers should be instructed to carry it in the hands, not on the shoulders, and to avoid unnecessary jolting. It is better for them not to keep step.

Have a warm bed ready to put him in. Remove the clothes with as little disturbance as may be, and do not cut anything that can be ripped. If a foot is hurt, the shoe and stocking will generally have to be sacrificed, but almost everything else can be ripped without ruining. Take the clothes from the sound side first, but, in putting on a garment, begin with the injured side. Special directions for undressing a woman are hardly needed; in case of a man, a point to be remembered is to unfasten the suspenders behind as well as in front. All the clothing can then be easily removed under cover of a sheet.

Severe injury of any kind may be followed by shock, or collapse—a complete prostration of the vital powers. The patient lies in an apathetic state, though not unconscious, the surface pale and covered with cold perspiration. There will be an abnormally low temperature, feeble pulse, dilated nostrils, drooping lids, both mental and muscular weakness, and, in less severe cases, nausea and vomiting. Death may be caused indirectly by failure to rally from this condition. Keep the patient's head low, and give stimulants till the heart's action is revived; apply heat to the extremities and the pit of the stomach. Hot tea, coffee, or beef-tea, may be given if it can be retained. When there is nausea, brandy is the best form of stimulant.

Syncope, or fainting, manifests many of the same signs as shock, and mild forms of the latter are often confounded with it. There is unconsciousness, occasioned by an insufficient supply of blood to the brain. Do not raise the head, keep it as low as, or lower than, the feet; this position alone, with plenty of fresh air, will often restore consciousness. If the condition persists, proceed as in case of shock. Ammonia may be given by inhalation, but not too strong, as the irritation may occasion dangerous bronchitis.

Broken bones are among the most common casualties. It is a mistaken impression that a fracture must be set immediately. It will do less harm for it to be left a day or two without splints, than for them to be awkwardly applied. Handle the injured part as little as possible, and do not attempt to do more than to keep the patient comfortable and quiet until a competent surgeon can be obtained. Merely temporary splints may be put on, made of pasteboard, shingles, or any smooth and stiff material at hand, to prevent the spasmodic twitching of the muscles, which adds to the pain. If it is a limb that is broken, get it in a natural position, making some extension, and support it firmly. Elevate the limb slightly, and apply cold water over the seat of fracture to keep it from swelling. A broken leg may be laid in a pillow, which is then bandaged closely around it, or bound to a straight stick, padded, or even to the other leg. With fracture of the patella, the foot should be elevated to a considerable height, and the leg kept straight by a long splint at the back. Put a pad under the knee. For a fractured thigh, extend the limb and bind it against a splint long enough to reach from the axilla to the heel. With a broken arm, bend the elbow, keeping the thumb up, fasten a well-padded splint on each side, and place the arm in a sling. With a fractured clavicle, lay the patient on his back, without a pillow, with the arm of the injured side bound across the chest. For fractured ribs, keep the patient quiet in bed, put a broad bandage tightly around the chest to limit its movements. Note whether any blood is raised. If skull fracture is suspected, keep the patient in a quiet, dark room, on his back, with the head slightly raised, apply cold cloths to the head. For fracture of the jaw, close the mouth, and fix in place with a bandage.

When a dislocation occurs, it is much more important for it to be speedily reduced, as the muscular tension increases and the reduction becomes more difficult with each hour that passes. There are one or two which you may try yourself to put in place. Dislocation of the jaw is one easily managed, and in which delay is particularly trying to the patient, as it will be fixed immovably, rendering him unable to speak. To reduce this, place the thumbs on the back teeth and the fingers under the jaw. Depress forcibly the angle of the jaw, at the same time lifting the chin. The thumbs need to be well protected, for the jaw will slip in place with a snap, and unless they are quickly moved aside, they may get badly bitten. Dislocations of the fingers can generally be reduced by forcibly pulling them. A thumb out of place is more difficult, sometimes impossible to return. Too much force should not be used in the attempt. Larger joints, you will hardly dare to meddle with, owing to the difficulty of making a positive diagnosis, and the danger of creating complications. After any dislocation, the joint will for some time be weak and liable to a recurrence of the accident, so that, when it has once been reduced, the parts should be firmly bandaged or strapped in place, until they have grown quite strong again.

Sprains occur most frequently at the wrist and ankle-joint. Hot fomentations will be found most grateful at first, and evaporating lotions during the inflammatory stage. Complete rest is essential. Massage is useful, and, when the swelling goes down, the joint should be supported by bandaging or strapping.

Contusions, or bruises, are best treated by rest and cold applications. After a general contusion, a warm bath may be found helpful. Severe contusion is often followed by symptoms of shock. A painfully crushed finger, or toe, may be wrapped in soft cloths wet with cold water and a little laudanum. With contused and lacerated wounds, there must be especial care in cleaning out the blood-clots. In the case of all wounds, there are five points to be attended to : to arrest the hæmorrhage, get the wound clean, bring the cut surfaces together, see that there is a way of escape for any discharge, and protect the wound from the air. With all extensive wounds, especially those of the thoracic and abdominal cavities, rest is important. When the chest is injured, lay the patient on the wounded side rather than the other.

A ghastly effect is often produced by a wound which bleeds freely, but which, when it is cleaned up, proves unimportant. This is apt to be the case with cuts about the head and face. In washing, do not touch the wound itself, but irrigate or squeeze a stream of water over it from a clean sponge. When you are sure that no dirt or other foreign matter is left in it, bring the edges as nearly as you can to their original position. If the wound is but slight, they may be held in place by adhesive strips, leaving room between them for the escape of blood and pus. Over this, put some simple dressing to exclude the air. On the scalp, a dry dressing will answer. Here the hair will have to be cut or shaved off about the wound before the strips are applied. For a deep incision, or one that can not be held together by adhesive plaster, surgeons use sutures of silk, catgut, or fine wire. To put these in, a needle with a cutting edge is required. A cut finger needs only to have the edges brought snugly together and bandaged. For slight wounds on the face, collodion is sometimes used in place of plaster, after the bleeding is checked. This is a solution of gun-cotton in ether. When applied, the ether evaporates, leaving an adhesive, transparent, and highly contractile film. One layer only is to be used, as it contracts so forcibly that a second will drag off the first. The parts must be held together until it is dry. It is useless to apply it over a wet surface. If a finger, a portion of the scalp, or any small part is entirely cut off, there is still a chance of its growing on again, if it is cleaned, immediately replaced in the proper position, and so bound on that a firm and even pressure is made. The experiment is at least worth trying, for if it fails there is no great harm done.

With a punctured wound, the important point is to keep it open until it heals from the bottom. If made by a splinter, or thorn, this must be entirely removed, not by poking at it, but by making a sharp incision along its course, so that you can get at and withdraw it. The incision, though it seems like increasing the wound, is likely to heal sooner and better than the puncture. If the splinter goes under the finger-nail, scrape the nail thin over it, and cut out a strip.

Never try to extract a fish-hook, or any barbed instrument, by the hole at which it entered. Push it all the way through and break off the head.

There is scarcely an injury so trivial that it may not under suitable conditions give rise to tetanus—lockjaw. It comes most often from wounds of the hands or feet. The symptoms come on about the eighth or tenth day, beginning with a slight stiffness of the muscles of the neck and lower jaw. Immediate advice is imperative.

In case of the bite of a venomous snake, or other probably poisoned wound, the bleeding should be encouraged rather than checked. Bathe it in warm water. Ligate the limb, if possible, above the point of injury, and suck it or apply cupping-glasses before absorption takes place. If the heart's action seems affected, keep the patient lying down, and give stimulants to the verge of intoxication. Cauterize the wound deeply, and then poultice it. The bite of any animal may be regarded with suspicion. That of the cat or rat is said to be more dangerous than that of the dog. Treat the bites and stings of insects with cool lotions. For the mosquito-bite, use ammonia or salt. Take care that the sting of a wasp or bee is not left in the wound, as it may set up serious irritation. A good way to remove it is to make strong pressure around the spot with the barrel of a watch-key.

The eruption from the *Rhus toxicodendron* (poison ivy), or the *Rhus venenata* (poison oak, or sumach), may be treated with a strong solution of bicarbonate of soda. These two are the only plants poisonous to the touch likely to be encountered in this part of the country.

Perhaps the most alarming accidents are those resulting from fire. If your own clothes catch fire, lie down on the floor and roll, keeping your mouth shut. If you see another woman in the same danger—it is most likely to be a woman—throw her down, and wrap around her a shawl, rug, or any heavy woolen thing at hand, to stifle the flames. Begin at the head and keep the fire as much as possible from the face. The great danger is of inhaling the flames.

In the treatment of burns or scalds, the first object is to exclude the air. This will at once allay the pain. If the injury is superficial, mere reddening of the surface, a solution of bicarbonate of soda, or even a simple cold water dressing, is as good as anything till the pain subsides. Then the part may be protected from the action of the air by painting it over with the white of an egg. As one layer dries, a second and third may be added. Flexile collodion, similarly applied, is even better, but it is not one of the things likely to be at hand in an emergency. Another plan is to dust with flour and cover with a thick layer of cotton-wool.

If the burn is severe enough to have blistered or destroyed the cuticle, the latter remedy should not be employed, for the discharge will harden the flour into crusts, and the fibers of the cotton stick to the wound, and can not be detached without pain. Carron-oil—linseed-oil, and lime-water, in equal parts—is a popular remedy, but pure olive-oil, or vaseline, is as good, or perhaps better, as linseed-oil often contains irritating impurities. From severe burns great deformity sometimes results, through the contraction of the skin in healing. It may be quite unavoidable, but something can be done toward preventing it, by keeping the burned parts in the best position, not always the easiest. A severe burn is usually accompanied by more or less shock, to be treated according to the directions already given.

The burns produced by strong acids are treated in the same way as those by fire, further caustic action being prevented by first bathing with some weak alkaline solution, as of soda or ammonia. Common earth, picked up almost anywhere, contains alkali enough to be useful.

Lime or caustic potash may make a severe burn. The treatment is still the same, the alkali being first neutralized by some acid, as diluted vinegar or lemon juice, about a teaspoonful to a cup of water.

If a fragment of lime gets into the eye, bathe it at once with such a solution, without wasting time in trying to pick it out. Any foreign body in the eye will occasion a great deal of pain. The irritation gives rise to an abundant secretion of tears, which will sometimes wash out the cause of trouble. Dust or small cinders may be cleared out by drawing the upper lid well down over the lower, and at the same time blowing the nose forcibly. If a particle gets caught under the lower lid, draw it down by the lashes, direct the patient to turn the eye-ball toward the nose, and the offending body can then be wiped out with a soft handkerchief. If it is under the upper lid, that can be turned up over a knitting-needle, or a small pencil, and treated in the same way. Always wipe the eye toward the nose, as the natural secretions flow in that direction. If the particle is imbedded in the surface of the eye-ball, it will have to be picked out by a sharp instrument. It takes a surgeon to do this safely. If the pain is still severe after the cause has been removed, take some laudanum in a tea-spoon, evaporate the alcohol from it by heating, dissolve the gummy residue in water, and bathe the eye with it.

Foreign bodies in the ear are often very troublesome. If an insect gets in, lay the sufferer down on the other side, straighten the tube of the ear by pulling the tip upward and slightly backward, and fill it with warm olive-oil or glycerine. The insect will be drowned in this and float to the surface. If some hard substance is in the ear, hold it downward, and syringe gently with warm water, taking care not to close the opening with the nozzle of the syringe. Do not try this if the object is anything that will swell with moisture, as a bean or a pea, as it will then only make a bad matter worse. Neither poke at it, as it may be easily driven in beyond reach. Get a doctor as soon as possible, as permanent injury to the ear may result if the obstruction is not removed.

When a foreign body is in the nostril, make the patient take a full breath, then close the mouth and the other nostril firmly, when the air, having no other way of escape, may expel the obstruction. If this fails, and the object is in sight, compress the nostrils above to prevent its being pushed farther up, and hook it out with a hair-pin or a bent wire.

Anything stuck in the throat, or œsophagus, may sometimes be hooked out in the same way, if it is too far down to be reached by the fingers. A pair of blunt scissors may be used in the place of forceps. It is hardly safe to try, as is often advised, to push the object down, unless it is some digestible substance which may be trusted to soften under the action of the secretions. If a piece of bread can be swallowed, it may carry down with it the obstruction. Once swallowed there need be no further apprehension on account of the size of the body, as whatever will pass through the gullet will get through the rest of the alimentary canal without difficulty. Do not give purgative medicine in such case, but food a little more solid than usual, in which it will be imbedded and carried along without irritating the passages.

A foreign body in the windpipe will usually be expelled by the coughing which its presence excites. The trachea is very sensitive, and the entrance even of a drop of water excites great irritation. A blow on the back will be of use if the person is choking. A child may be taken up by the feet and held head down while a succession of blows are administered between the shoulders. This will seldom fail to dislodge the object unless it has been sucked deeply into the air passages.

If the trachea is so obstructed, from any cause, that the supply of air is cut off from the lungs, and the blood fails to be oxygenated, asphyxia results. This is what occurs in drowning, strangulation, and suffocation by irrespirable gases. The action of the lungs may under such circumstances have ceased some time before death ensues, and, even when animation is too far suspended for the movements of the chest to be of themselves renewed, the lungs may sometimes be forced into action by artificial respiration. There are two methods commonly employed ; the most practiced is that known as "Sylvester's Ready Method." The first thing to be done is to pull the tongue forward, and keep it there.

so that it will not fall back and obstruct the trachea; an elastic band over the tongue and under the chin is advised for this purpose. Loosen all the clothing, and lay the patient on his back with head and shoulders slightly raised. Then, standing behind him, grasp the arms just above the elbows, and draw them slowly away from the sides of the body in an upward direction till they meet over his head. Hold them in this position for about two seconds, then bring them back slowly till the elbows meet over the chest, making some pressure. With the first motion the ribs are raised by the pectoral muscles, and a vacuum is created in the lungs, into which the air rushes. As the arms are brought back to the sides, the air is again forced out, as in natural respiration. The two movements should be repeated slowly and steadily, not more than sixteen times in a minute, and persisted in until respiration takes place naturally, or until all hope of establishing it must be given up. It is not to be considered hopeless under two hours.

"Marshall Hall's method" is sometimes used as a substitute for or alternating with Sylvester's. The body is laid flat on the face, and gentle pressure made on the back, after which it is turned over on the side; then again on the face, and the pressure reapplied. Repeat these motions at a rate of sixteen to the minute. The principle is the same, whichever method is adopted. It is well to practice one or both of them, that the motions may be familiar if suddenly called for. Cessation of breath for more than two minutes is usually fatal.

When a person is apparently drowned, the wet clothing must be promptly removed, the body dried, and well rubbed. Before beginning artificial respiration, turn the face down for a moment, and clean out with the finger any accumulation of mucus that there may be at the base of the tongue.

The same must be done in case of strangulation. Remove all constriction from the neck. If hanging, cut the body down, but do not let it fall. In poisoning from carbonic-acid gas (choke damp), or carbonic oxide (the fumes of burning charcoal), loosen the clothing, and, if the body is still warm, dash cold water over it forcibly and frequently. If it is chilled use hot applications instead. Employ artificial respiration, and give stimulants and nourishment as soon as they can be swallowed.

Sunstroke, or heat prostration, is, in most cases, preceded by headache, dizziness, and more or less mental disturbance. Direct exposure to the rays of the sun is not essential ; it may be produced by intense heat of any kind. Fatigue and foul air aggravate the tendency. Persons who have once been so affected are liable to a recurrence of the attack upon exposure to heat. The preliminary symptoms either become intensified until delirium sets in, or the patient falls suddenly unconscious, the face pale or dusky, the skin very hot, the breathing evidently difficult, and the pulse weak and fluttering. There are occasionally convulsions, but more often no movement after the first insensibility till death. The danger is imminent, the bodily temperature sometimes rising to 112° or 114°. The first thing to be done is to reduce this. Remove the patient into the shade, take the clothing from the head and chest, and throw cold water over the body, or put it in a cold bath, gradually reducing the degree of cold. Have all the fresh air possible, and as soon as a decline in heat is evident, artificial respiration may be resorted to, if necessary. If, after consciousness is restored, the temperature again rises, the cold applications must be repeated. Do not give alcoholic stimulants without medical advice. Aromatic spirits of ammonia may be used if a stimulant seems called for.

When death takes place from a stroke of lightning, it is the result of shock to the nervous system. This may be enough to produce unconsciousness without being fatal, and even when life is apparently extinct an effort at resuscitation should be made. Employ artificial respiration, and treat otherwise as directed for shock. It may be complicated by burns, which need the same attention as burns from any other source.

Any one suffering from the effects of severe cold must be kept away from the heat, as there will otherwise be danger of sloughing of the frost-bitten parts. A person found frozen should be taken to a cold room, undressed, and rubbed with snow, or cloths wrung out in ice-water. The friction should be continued, especially about the extremities, until the circulation seems restored; at the same time artificial respiration may be resorted to, if the natural is at a stand-still. Give brandy and beef-tea as soon as the patient is able to swallow. Only by degrees bring him into warmer air. The same plan is pursued with any frost-bitten part, the aim being to restore vitality without inducing sloughing. Parts of the body may be frozen without the sufferer's knowledge, as numbness and insensibility precede the later stages.

Convulsions in the adult are most commonly either from epilepsy or hysteria. An epileptic seizure may be distinguished from fainting—syncope—by the convulsive movements, which are absent in the latter. It is initiated with sudden loss of consciousness, and often by a peculiar sharp cry. The face is at first pale, but may afterward become flushed, there is frothing at the mouth, with jerking motions of the whole body or parts of it. This stage only lasts a few moments, after which the patient may recover consciousness, or lapse into stupor. The only treatment is to keep the patient from hurting himself during the convulsions. Lay him on the back, the head slightly elevated; loosen the clothing, and allow plenty of fresh air. Insert a folded towel between the teeth to keep him from biting his tongue.

Hysterical fits, most common in young girls, may be much the same in appearance, but the patient is not really unconscious, and never hurts herself. Any effort to open the eyelids will usually be resisted, and the eyeball will be found sensitive, as it is not in epilepsy. There is so little treatment needed in either case, that it is of little account whether or not you are sure which it is. Keep the patient quiet and free from sympathetic spectators. The mere suggestion of some disagreeable remedy will often terminate the seizure. It may be followed by the involuntary passage of a large amount of pale urine.

With the convulsions due to uræmic poisoning, there is usually also delirium. The breath has a urinous odor, and there will have been previous indications of dropsy. The usual treatment consists of hot-air or vapor baths, active purgatives, and applications of ice to the head.

In apoplexy, there are rarely convulsions. There is sudden loss of consciousness, without heart failure, the face is flushed or, more rarely, very pale, the respiration stertorous, the pulse slow and full, the temperature at first lowered, the pupils fixed, and one or both dilated, with paralysis of one side. There may be retention or involuntary passage of urine. The attacks are most common after middle life. As a fatal issue approaches, there will be a rapid rise of temperature. The patient should be moved no more than is absoluely necessary. Loosen the clothes, elevate the head and chest, apply cold to the head, and warmth to the extremities. Act on the bowels, but do not give stimulants or emetics. Apoplexy is likely to be confounded with intoxication, especially when the patient has recently been taking liquor, and carries the odor of it in his breath. In an intoxicated subject, the pupils are evenly dilated, and the stertorous breathing is absent. He can generally be roused, though he sinks back again into stupor. The temperature is likely to be two or three degrees below normal. Lay the patient on the side, the head somewhat elevated, and induce vomiting.

A person found insensible may be suffering from one of the above described affections, from concussion or compression of the brain following injury to the head, or from narcotic poisoning. In all cases, keep the head cool and the feet warm, and get medical advice as soon as possible.

Poisons may be classified as *irritant*, those destroying the tissues with which they come in contact, producing death by shock to the nervous system ; *narcotic*, those producing insensibility and death by their action on the brain, without local effect ; and *acro-narcotic*, those which combine the action of the other two. Treatment has three things in view: to remove the injurious substance, neutralize its further action, and remedy such ill effects as it may have already produced. The stomach is to be evacuated by emetics. The famous stomach-pump is hardly worth referring to, as it is highly improbable that you will have one at hand in an emergency, or know how to use it if you did. Dr. Esmarch, in his lectures to nurses on the treatment of emergencies, advises in its place that you make the patient swallow twenty or thirty inches of rubber tubing, half an inch in diameter, which can then be used as a siphon by alternately holding up the free end and pouring water into it, and depressing it below the level of the stomach to let the water run out. This method is said to have been used very successfully by German physicians, but it presupposes very energetic co-operation on the part of the patient. Ordinarily an emetic is preferable and certainly easier to get swallowed. You will be able to get nearly everywhere, at short notice, warm water and salt, or ground mustard, either of which is an excellent emetic. Stir up a table-spoonful in a cup of the warm water, and give repeatedly. The same quantity of wine of ipecac in water, or sulphate of zinc, twenty grains at a time, may be given. Tickling the back of the throat with the finger or a feather will sometimes induce emesis. Emetics should be condensed and frequent. Half a pint to a pint at a time is enough. Too large a quantity may distend the stomach to the point of paralyzing the muscular walls, and too dilute solutions will act as purgatives instead of emetics. It may be desirable in some cases, after the stomach has been cleared, to evacuate the bowels also, as some of the poison may have passed into them. Do not stop to dissolve emetics fully, but stir them up in water and give as quickly as possible. After any irritant poison give some bland fluid to sooth the injured parts. White of egg, milk, mucilage and water, flour and water, gruel, olive or castor oil may be used. Oil must not be given in case of poisoning by phosphorus or cantharides. For all the acids, alkalies are the chemical antidote, and *vice versa*. The antidote to a poison is either chemical, uniting with it to form a harmless compound, or physiological, correcting its effects upon the system.

THE MORE COMMON POISONS, THEIR SYMPTOMS, ANTIDOTES, AND TREATMENT.

POISONS.	SYMPTOMS.	ANTIDOTES AND TREATMENT.
ACIDS. Acetic. Citric. Muriatic. Nitric. Oxalic. Sulphuric. Tartaric.	All highly corrosive, excoriating the parts with which they come in contact, occasioning intense pain, followed by symptoms of shock. Nitric acid makes yellow stains; sulphuric blackens.	For nitric and oxalic acids, the carbonate of magnesia or lime; for sulphuric acid, strong soapsuds; for oxalic, lime water; for the others, any dilute alkali. Induce vomiting, give demulcent drinks, and treat the consequent inflammation and shock as if from any other injury.
Carbolic.	Caustic; whitening of the mucous membrane, with intense burning and numbness, nausea, weakness, stupor, and collapse.	Oil, milk. Secure rest, warmth of the body, and stimulation.
Prussic.	Gives an odor of peach kernels; nausea, giddiness, pain in the head, convulsions and death.	Dilute ammonia. Cold affusion to the spine, emetics, and stimulants. A fatal dose leaves scarcely time for any treatment, death occurring in from three to five minutes.
ALKALIES AND EARTHS. Ammonia. Baryta. Lime. Potash. Soda.	Violent caustics, causing destruction of the mucous membrane, acute burning pain, vomiting and purging of bloody matter, and death by shock.	The vegetable acids — dilute vinegar, lemon-juice, etc.—neutralize them. The fixed oils — castor, linseed, olive, etc.—unite with them to form harmless soaps. Give these, and demulcent drinks; stimulants, if necessary.

THE MORE COMMON POISONS, THEIR SYMPTOMS, ANTIDOTES, AND TREATMENT—(*Continued*).

POISONS.	SYMPTOMS.	ANTIDOTES AND TREATMENT.
METALLIC IRRITANTS.		
Antimony. *Tartar Emetic.*	Symptoms like those of cholera; violent cramps and purging, collapse; inflammation of whole alimentary canal, with metallic taste, suppression of urine, vomiting, cramps, delirium or stupor, death.	Induce vomiting, if the poison has not already done so, and give astringent infusions, as of strong tea or oak bark. Starch unites with iodine, forming an insoluble compound, but not with the iodide of potassium.
Arsenic. *Paris Green.* *Scheele's Green.* *Fowler's Solut.*	Intense pain, thirst, vomiting and purging, tenesmus, suppression of urine, clammy sweat, delirium or collapse, and death either in a few hours from shock, or after several days from inflammation.	The hydrated sesquioxide of iron—prepared by adding ammonia to the common muriated tincture, and washing the precipitate—is the antidote. Give *ad lib.* Or dialyzed iron and magnesia, half an ounce of each every ten minutes. After Fowler's solution, give lime-water freely, evacuate the stomach, and give demulcents.
Bismuth. Copper. *Blue Vitriol.* *Verdigris.* Iodine. Iron. *Copperas.*	Symptoms like other irritants.	Emetics, milk, albumen, and mucilaginous drinks.
Lead.	May occasion paralysis.	
Mercury. *Corrosive Sub.* *Vermilion.*		Albumen in some form, the white of one egg to four grains of corrosive sublimate, milk, flour gruel.

Phosphorus.		Emetics, mucilage, and magnesia. No oil.
Silver, *Nitrate of.*		May be decomposed by common salt.
Tin.		Carbonate of soda in solution, milk and albumen.
Zinc.		
White Vitriol.		
VEGETABLE IRRITANTS Colocynth. Croton Oil. Savin Oil.	Violent vomiting, diarrhœa, and pain, thirst and constriction of the throat, difficult breathing, delirium or stupor, death.	Evacuate the stomach and bowels as promptly as possible, and stimulate.
ANIMAL IRRITANTS.		
Cantharides.	Severe pain and burning all through the alimentary canal, bloody evacuations, strangury or retention of urine, convulsions, delirium, death.	Excite vomiting, give emollient drinks and enemata, but no oil. Rub the abdomen with camphor, or camphorated oil to relieve the strangury.
Poisonous fish.	Indigestion, headache, vertigo, thirst, vomiting and diarrhœa, collapse. Often an eruption on the skin.	Emetics, purgatives, and stimulants.
NARCOTICS and ACRO-NARCOTICS. Aconite. Alcohol. Belladonna (*Nightshade*). Camphor. Chloral. Colchicum. Conium (*Hemlock*). Digitalis (*Foxglove*).	These are nearly all vegetable poisons. They occasion nausea, numbness, stupor, delirium or convulsions, over-stimulation of the heart, followed by its failure, insensibility, coma, death. With the acro-narcotics, these symptoms are preceded by those of irritants, an acrid taste, dryness, and constriction of the mouth and throat, fever, vomiting and diarrhœa, with intestinal pain. The pupils of the eyes are usually di-	Evacuate the stomach as thoroughly as possible, and give active purgatives; give strong coffee and keep the patient roused. The custom of walking the patient up and down, and slapping with wet towels, is objectionable; it adds exhaustion to depression, and risks giving him pneumonia. Keep him in the recumbent position, and employ friction, and, if necessary, artificial respiration.

THE MORE COMMON POISONS, THEIR SYMPTOMS, ANTIDOTES, AND TREATMENT.

POISONS.	SYMPTOMS.	ANTIDOTES AND TREATMENT.
Dulcamara (*Bittersweet*). Ergot. Hellebore. Hyoscyamus. Laburnum. Lobelia. Nux Vomica.	lated, except under opiates, which contract them. Belladonna dilates them widely.	
Strychnia. Physostigma. Opium. *Laudanum.* *Morphia.* Tobacco. Toadstools. Turpentine.	Strychnia excites violent convulsions, like those of tetanus.	The spasms may be quieted by inhalation of ether.
GASES.		
Carbonic acid. Carbonic oxide. Nitrous oxide. Sulphuretted hydrogen. Chlorine. Chloroform.	Chlorine violently irritates the respiratory organs; the others act like narcotics. Each has a certain characteristic odor, by which it may be recognized.	Give plenty of fresh air, cautious inhalations of ammonia, stimulants, and artificial respiration, if necessary.

CHAPTER XX.

Obstetric emergencies—Utero-gestation—Symptoms of pregnancy—Abortion—Parturition—The three stages of labor—The conduct of each—How to treat the child, the placenta, the mother—How to wash and dress the baby—Lactation—The care of the infant—Care of the mother during the puerperal state—Dangers of the puerperal state.

IT is, perhaps, more often in obstetric cases than in any others that the nurse will be called upon to assume, in his absence, the responsibilities properly belonging to the physician. It may happen that she will have to deliver the child before medical aid can arrive, and a nurse who undertakes this branch of the work should, at least, know how to conduct a normal case in an emergency without direction, for the lives of both mother and child may depend upon her skill and promptness. In order to be prepared for such an occasion, should it arise, it is necessary for her to possess a much fuller knowledge of midwifery than she will ordinarily be called upon to put into practice. The following instructions need to be preceded by a more thorough acquaintance with pelvic anatomy and physiology than can be given here.

The development of an embryo in the uterus is known as pregnancy, or utero-gestation. During this condition the uterus becomes enlarged, rises out of the pelvis, and occupies the abdominal cavity. Other physical signs are suppression of the menses, enlargement of the breasts and the presence of milk in them, and movements of the fœtus. Milk is sometimes found in the breasts as early as the second month. This is pretty reliable evidence of pregnancy. Another early and reliable sign is a deep violet discoloration of the vagina. The mammary glands are so intimately connected with the reproductive organs as to be usually classed among them. During pregnancy they become swollen and tender, the veins enlarge, and the circles, or areolæ, about the nipples become discolored. Swelling of the feet is not uncommon, with enlargement of the veins of the legs. When there is much œdema of the legs, the urine should be tested for albumen, and, if it is found to be present in any quantity, the physician should be informed. Bladder disturbances—as retention or incontinence of urine—are not uncommon. A leucorrhœal discharge may be present. Constipation, diarrhœa, and other disturbances of digestion may be looked for. Nausea, particularly distressing in the morning, and thence called "the morning sickness," is common in the early stage of pregnancy. There may be at the same time an abnormal appetite. Salivation sometimes occurs. During the fourth month the movements of the fœtus usually begin to be felt by the mother. At this time the uterus rises above the brim of the pelvis, and the nausea may be expected to subside. Many nervous manifestations may accompany pregnancy—as insomnia, irritability, neuralgia, headaches, toothaches, etc. It is not considered advisable to have teeth extracted at this time. A cough is common, and in the later stages dyspnœa, arising from pressure upon the lungs. Neither of all these symptoms occurring singly has any diagnostic value, nor is the absence of them to be counted as negative proof; but, when they are found together, they afford strong presumptive evidence of pregnancy. Still, a spurious pregnancy will sometimes manifest all of the subjective and even some of the objective symptoms. Perhaps the only positive tests are by ballottement and auscultation of the fœtal heart. Ballottement consists in displacing the fœtus by a push of the examining finger, against which it rebounds with some force, and is recognizable to the practiced touch. It may be performed either externally or internally. The beating of the fœtal heart will usually be audible by the fifth month through the stethoscope. It is very rapid—one hundred and forty or one hundred and fifty beats per minute—and so readily distinguished from the maternal pulse. When these sounds can be clearly heard, there can be no doubt of the presence of a living child.

During its intra-uterine existence the embryo, or fœtus, is contained in a sac—the amnion—which secretes the watery amniotic fluid in which the fœtus floats. The fœtus is connected with the uterine wall by the placenta and the funis, or umbilical cord. Through these it receives its nutriment from the mother.

At the end of nine months the embryo is fully developed, and is expelled from the uterine cavity, the process being known as labor, or parturition. If such expulsion occurs before the embryo is capable of maintaining an independent existence—that is, earlier than the seventh month—it is known as abortion or miscarriage; if later than this period, but before the end of the ninth month, it is called premature labor.

The first indication of an approaching abortion is usually hæmorrhage from the uterus, generally accompanied by pain. The patient should at once be put to bed, as the threatened miscarriage may in some cases be averted by rest and quiet. If this can not be done, care must be taken that the placenta and its membranes, the secundines, are all expelled as well as the fœtus, as their retention may occasion dangerous hæmorrhage or blood-poisoning. The patient should have as much care after a miscarriage as after labor at full term, being allowed in no way to exert herself. It is a great mistake to regard it as of slight importance; the loss of blood is often excessive, and the shock to the nervous system is greater than that produced by regular labor. The one is a natural, the other a pathological process. A season of perfect rest is necessary to allow the uterus to return to its natural state. Miscarriage is more common among multiparæ, women who have borne children, than among primiparæ, those who bear for the first time. After it has occurred a few times a predisposition to it exists, and it becomes difficult to carry a child to full term.

The full duration of pregnancy is 280 days. The approach of labor is heralded by certain preliminary symptoms. During the last two weeks, the abdomen diminishes in size, the uterus sinking down into the pelvis. The pressure upon the lungs gradually becomes less, so that the difficulty of breathing is removed, but there is increased pressure upon the bladder and rectum, occasioning frequent evacuations. Uterine contractions begin to be felt, and are finally attended by pains. These may be true labor pains or false pains. True labor pains come on at regular intervals, increasing in intensity, and are felt in the back. False pains are chiefly in front, and are short and irregular. They do not aid at all in the labor, but usually result from indigestion or an overloaded state of the bowels. A dose of castor-oil will clear the intestines and probably relieve false pains, but given late may precipitate the real labor. With the coming on of true pains there is often a discharge of blood and mucus, sometimes called the "show."

There are three distinct stages of labor. The first is the stage of dilatation of the cervix, terminating with the rupture of the "bag of waters." This bag is formed by the pressure of the contracting uterus upon the membranes containing the amniotic fluid, and by the same means is forced through the cervical canal, thus dilating it. This is what takes place during a pain. In the intervals between the pains, the uterus relaxes, the amniotic bag becomes less tense, and the position of the child may be made out through its walls. When the os is sufficiently dilated, the bag usually bursts and the amniotic fluid gushes out. This terminates the first stage of labor.

The second stage includes the passage of the child along the pelvic canal, and is concluded by its delivery. After the membranes have been ruptured and the fluid has escaped, the uterus contracts directly upon the child more and more strongly, forcing it toward the pelvic outlet, the point of least resistance. Each pain is now accompanied by a strong impulse to bear down, which aids in the expulsion of the fœtus.

After this is accomplished, there still remains the third stage, during which the uterus contracts upon the placenta, detaching it from the uterine surface and pushing it also out. The expulsion of the placenta ends the third and final stage of labor, and the woman now enters upon the puerperal state. The empty uterus contracts into a firm, hard ball, felt just above the symphysis pubis. It continues for some little time to maintain more or less painful contractions known as after-pains. This condition gradually disappears. A discharge called lochia is set up which lasts for three or four weeks. It takes six for the organs to regain a normal size and condition. The process is known as involution, the mother during this time as a puerpera. The puerperal state is one of peculiar liability to contagion. The interior of the uterus is after delivery in the condition of an open wound, eminently fit for the reception and development of septic germs. For this reason a nurse must never go to an obstetric case from one of contagious disease of any kind, or from a severe surgical case.

It is during the first stage of labor that the nurse is likely to be summoned, and she should answer the call as promptly as possible, so as to have time to make all necessary preparations for the birth of the child without hurry.

The average duration of a natural labor is twenty-four hours, but in women who have previously borne children, and often even in primiparæ, it is frequently much less.

When it is determined that labor is actually in progress, the patient and the room should be got in readiness. Unless there is a previous history of precipitate delivery, the patient need not at once be put to bed, indeed, it is rather better that she should stand or walk about, resting occasionally on a chair, but maintaining an upright position, as this renders the axis of the uterus coincident with that of the pelvis, and so favors the descent of the head. The bed should be prepared for her, and well protected. The under-sheet must be put on tightly, as it may not be changed again for some days, and covered by a rubber and draw-sheet. Where the pelvis will rest put a firm pillow, or some folded cloths, to elevate it a little. Over these a second rubber and draw-sheet are desirable, which, after the labor is over, can be removed, leaving the first clean and dry for the patient to lie on.

She should have on a clean night-dress and over it a warm wrapper which can easily be slipped off when she is ready to go to bed. Brush the hair and braid it tightly. Give a thorough enema, and see that the bladder is emptied. It may be necessary to use the catheter, owing to closure of the urethra by the pressure of the fœtal head, but usually there will be frequent and voluntary passage of urine. See that there are at hand plenty of clean towels, hot and cold water, ice, soap, scissors, string, safety-pins, napkins for mother and child, a binder, a small blanket to receive the baby, a little bath-tub, soft linen rags, a sponge, and clothing for the child, two chamber-vessels, a bed-pan, a syringe, a soft rubber catheter, vaseline, carbolic acid, olive-oil, fluid extract of ergot, and chloroform.

The patient should be allowed plenty of digestible food, but no stimulants, as they increase the danger of post-partum hæmorrhage.

The first stage of labor occupies from three to six hours. An examination must be made early to discover the presentation of the child, but, when this is once clearly made out, too frequent examinations are to be avoided, as during this stage they only irritate without being of much use. The examining finger, well oiled, should be introduced into the vagina during an interval between pains until it reaches the open mouth of the uterus. The membranes are then lax, and the presenting part of the fœtus can be most easily felt, but the degree of dilatation of the os can only be accurately ascertained during a pain, when the membranes are pressed against it. The examination, then, should occupy the time taken up by a pain, and part of the interval preceding or following. In the first stage these intervals are long. Efforts at bearing down should not be encouraged, as their only effect is to exhaust the patient's strength. There is often nausea and even vomiting. Chills are not of rare occurrence. Neither of these is at all an alarming indication. The patient should be put to bed when the pains pass from back to front, before the membranes are ruptured, if that event can be anticipated, as, if the body is upright when this occurs, there is danger that the umbilical cord will be washed down in the gush of waters. The clothing should be pinned up well out of the way, and an extra sheet spread over the lower part of the person. No one should now be allowed in the room but the necessary assistants.

The position taken may be on the back or the left side, as preferred, in either case near the edge of the bed. The latter is the English mode of delivery; in this country the dorsal decubitus is quite as usual, and generally seems easier for the patient. Very little exposure is necessary; the clothing can be so arranged as to cover the patient, and yet be protected from discharges.

If you have not been able to decide with certainty the presentation of the child before the membranes are ruptured, it is important that you do so immediately after, as there is a possibility of correcting a mal-presentation by external manipulation, if it is discovered early, a possibility which is lost after the child once sinks into the basin of the pelvis.

In a natural labor, the head presents. This is the largest part of the child's body, and where it goes the rest easily follows. The bones of the cranium are soft and yielding, and united only by membranes, so that when pressed together they can overlap. There are two spaces between them known as the anterior and posterior fontanelles. By these and by the cranial sutures the head is recognized, as well as by being harder and firmer than any other part. After the rupture of the membranes, the scalp will afford a rough hairy sensation and the fontanelles can be distinguished from each other. The anterior is the larger and has four corners, the posterior is triangular.

Pass a finger around the edge of the os to see if any part besides the head has descended. If the cord has prolapsed, try if possible to replace it above the head, as it is likely to be crushed during the progress of labor, so cutting off the child's circulation with fatal result. The operation of returning it will be facilitated by having the patient rest on her knees and elbows.

During the second stage, examination must be more frequent, to test the degree of advancement of the head. The pains will now be more severe, the intervals between them shorter, and there will be an impulse to aid them by bearing down. This need not be suggested, as it will come of itself at the proper time. The patient not infrequently drops asleep for a few moments between the pains. The only assistance that can now be rendered is to support the back, and to give the patient something to pull upon if she feels inclined. A sheet knotted to the foot of the bed may be useful for this purpose. As the head approaches the perinæum, this should be taken away, and the bearing down efforts discouraged, lest it be too suddenly stretched and so torn. The progress of the head through the vulva must be rather restrained than hastened, as, the more gradual it is, the less is the danger of such perinæal rupture. This is most likely to occur in a primipara, and is usually in consequence of the head being driven too much backward, and too forcibly against the perinæum. It may sometimes be averted by supporting the perinæum with the palm of the hand, and guiding the head forward. This support should not be continuous, but applied during the last two or three pains, when the anterior margin of the perinæum grows evidently thin. Careful watch should be kept, and, as the head emerges, it should be pressed forward and slightly upward, so as to relieve the strain upon the perinæum as much as possible. The hand should not follow the head, but be kept upon the perinæum as it retracts. It is well to do the same while the shoulders are passing, though the greatest danger is over when the head is safely born. Look to see if the cord is about the child's neck, and, if you find it so, draw it gently down and slip it over the head. If it can not be loosened enough for this, or to let the body pass through it, or if it is wound two or three times around the neck, put a finger under one loop and cut it, tying both ends. There will usually be plenty of time for this, as there is apt to be an interval of several minutes before the shoulders follow the head. After that the perinæum need no longer be supported, and the hands may be free to receive the child.

As soon as it is born, lay it down at right angles to the mother, close enough to make no traction on the cord. The shock of exposure to the air will generally excite inspiration. If it does not, wipe out the mouth with a soft cloth, to remove any mucus that may obstruct it, slap the child on the back, blow on it, or sprinkle with cold water. Do not cut the cord until the child has cried or until no pulsation can be felt in it. Tie it with a strong, not too fine, string—narrow tape is suitable—in two places, one about two and the other three or four inches from the child's abdomen, and cut between the two with blunt scissors which will crush the vessels. The end of the cord should be examined after an hour or so, and, if there is any bleeding, another ligature should be applied. The ligature on the placental end is to keep the placenta from being drained of blood, in which case its shrinkage would make its expulsion less easy, and, in case of twins, might be fatal to the second child. The child once separated from the mother, and breathing properly, may be wrapped in a blanket and laid aside in a safe place while the mother receives attention. If the above treatment has not succeeded in establishing respiration, and the infant is apparently still-born, artificial respiration should be tried, after Sylvester's method. Dipping the child alternately in warm and cold water may be effectual. This must be done quickly. Also the surface may be rubbed with brandy or whiskey. Immediately upon the birth of the child, the assistant should have placed one hand over the abdomen to secure contraction of the uterus and to ascertain if there is a second child in it. It should be firmly held until after it is entirely empty.

The expulsion of the placenta may follow immediately upon that of the child, or after an interval of half an hour or more. If after its separation from the uterus it is detained in the vagina beyond a reasonable time, slight traction upon the cord will usually serve to remove it, but no such traction should be made while there is any attachment to the uterine surface. The uterus may be recognized as empty when it is felt as a firm, hard wall just above the symphysis pubis. If it fails to contract after the birth of the child, press it, with the hand over the fundus, moderately down into the pelvis. This will generally stir up a pain. If the placenta is not then expelled, repeat the movement with the next pain. As the placenta slips from the vulva, it should be caught and twisted round and round, so that none of the membranes will be left behind. A vessel should be at hand to receive it. Later it must be carefully examined to see if it is entire. If any portion is missing, it must be looked out for until it is passed, as it is a possible source of danger so long as it is retained. After examination, burn or bury it.

The vulva may now be bathed with warm water, the soiled articles removed, a clean napkin placed over the part, and a binder pinned firmly about the abdomen. A straight band eighteen inches wide is the best shape for this. It can be closely fitted with pins, and should come well below the hips, so as not to ride up. Sometimes a folded towel is put under it, just over the fundus uteri, to make additional pressure at this point.

The mother must now be kept quiet, no talking allowed, no visitors, no excitement of any kind.

While the mother rests, further attention may be paid to the child. It will be more or less covered with a cheesy varnish, *vernix caseosa*, to remove which, rub it over with oil and then wipe off with a soft cloth. See that the ligature on the umbilical cord is secure, and immerse the child, excepting the face, in warm water. The bath should be given in a warm place, and its temperature be not much above that of the air. An old-fashioned way of testing the heat of the water is by the elbow, to which it should feel neither cold nor warm.

Take the feet of the child in the right hand, the shoulders in the left, letting the head rest upon the arm, and lower it very gradually into the water. Still supporting the head with the left hand, wash it all over with a clean soft sponge, then lift it out into the folds of a warm towel. Dry thoroughly, especially about the joints, but without much rubbing.

Take special care to see that the eyes are clear. Dust with fine toilet powder under the arms and between the legs, and look to see if the anus and urethra are open, and the child in a normal condition all over. Dress the cord with a bit of soft linen dipped in vaseline, having a hole in the center. Put the cord through the hole and lay it on the left side of the body, over it two or three folds of dry linen. Keep the dressing in place by a flannel band about the abdomen, tight enough not to slip, but not tight enough to impede the child's respiration. All the garments should be warm and not too tight. Put one inside another, and the whole on over the feet rather than the head, turning the child no more than is necessary. The child must be bathed, and the cord dressed daily until it falls off, which it will do in about a week or ten days. A compress moistened with oil must still be kept over the umbilicus, until it is depressed and of the same color as the surrounding skin. Milk will sometimes be seen in the child's breasts for a few days after birth. If they are swollen and hard, rub them very gently toward the nipple with vaseline, and the condition will gradually disappear.

After the mother has rested a few hours, and the child has been washed and dressed, it is well to put it to the breast. The first milk, the colostrum, is of quite different quality from the later secretion, and has a purgative effect upon the child, clearing the intestines of the meconium, a dark viscid matter with which they are loaded at birth. The suckling of the child helps to secure contraction of the uterus, often occasioning quite severe after-pains ; it excites fuller secretion and draws out the nipple. Indeed, it is quite as much for the mother's sake as the child's that it is put to the breast thus promptly. The baby will not suffer if it has no food at all for the first twenty-four hours. The colostrum is scanty but quite sufficient for the need. Nothing else should be given unless, perhaps, a little, very little, warm water and sugar. The milk does not appear in abundance until about the third day. There is almost always some pain and rise of temperature accompanying it, and, if the breasts are not properly relieved, milk fever and mammary abscess may ensue. If the child can not empty the breast sufficiently, the milk should be drawn off by a breast-pump. A good substitute for a breast-pump is a champagne bottle with a smooth edge ; fill it with hot water, let it stand a moment, then pour it out quickly, oil the edge, and apply the mouth of the bottle over the nipple. As the heated air condenses, the milk will be sucked out into the bottle. The condensation may be increased by wrapping around the bottle a towel wet in cold water. The same method is useful to draw out a retracted nipple, which the child has difficulty in grasping. In putting the child to the breast, see that the nostrils are not obstructed, otherwise it can neither breathe nor suck ; alternate the use of the breasts. They should be protected by an extra covering, as they are very sensitive to cold. If the nipples are tender, bathe them in spirits, and wash them off carefully before and after each nursing. They may be hardened by daily bathing with alcohol, for some time previous to the confinement. If they become excoriated and fissured, nipple-shields may be necessary.

If the child, for any reason, is not to nurse, the secretion of milk must be checked. This is usually done by bandaging the breasts closely, supporting them by pads of cotton at each side, so that the pressure will be made evenly. The bowels must be kept open, and the amount of fluid taken into the system limited as far as possible. Belladonna is sometimes employed to help dry up the secretion, usually in the form of an unguent rubbed in gently. Rubbing of the breasts must always be toward the nipple. In the absence of the mother's milk, that of a suitable wet nurse is the best food for the child. She should be a healthy and not nervous woman, whose own child is nearly the age of the one she is to nurse. If cow's milk is used for the child, it must be at first diluted with twice as much water and slightly sweetened. The proportion of water may be gradually lessened, until after six months the milk may be given pure. Condensed milk is perhaps of more even quality than the ordinary, unless the milk of a single cow can be secured. If the child is not to nurse its mother, it may be given half a teaspoonful of the syrup of rhubarb soon after birth to remove the meconium, as it will miss the purgative action of the colostrum. The meconium ought to be cleared out and water passed during the first twenty-four hours. If the latter fails to occur, apply a hot stupe over the kidneys. The napkins should be changed as soon as wet, and not used again without washing. The bowels may be expected to move once or twice daily. Digestion in the infant takes place in little over an hour. The child should be fed during the first two months, at intervals of two hours, regularly. The mouth should be washed out after each nursing. It should not be allowed to go on sucking indefinitely after it has had food enough, or to suck an empty feeding bottle, its own fingers, or anything else. This may keep it quiet for a time, but ultimately makes matters worse, by getting its stomach overloaded or full of wind. A baby need not be assumed to be hungry because it cries, but something is the matter with it, and it is the business of the nurse to find out what. It does not cry unless it is in some way uncomfortable. A child a month old should sleep twenty hours out of the twenty-four without being rocked or carried about. Habits will be easily acquired even at this age. The child should sleep in a crib, and be taught to go to sleep by itself. Let it lie on either side, not directly on the back, as there is danger in this position that the milk may regurgitate and get into the trachea. Do not have a strong light in the room, as the eyes of both mother and child are weak.

The mother during the puerperal state requires the most careful nursing. She should be kept in bed for ten days or two weeks, not being allowed to sit up for any purpose, or in any way to exert herself. It is of the greatest importance that she and everything about her be kept clean. She should have a carefully given sponge-bath all over every day, and the vulva should be washed two or three times daily. If the lochia has a disagreeable odor, a vaginal douche may be given morning and night of carbolic solution, 1–80. There should be no odor perceptible on entering the room. Have plenty of fresh air, but at the same time be careful to avoid chilling the patient, especially when she first gets up. The catheter must be used every six or eight hours, if the bladder can not be otherwise emptied. There is often temporary paralysis of the urethra following labor. An emollient enema should be given on the third day, and every second day thereafter, until the bowels move naturally. The diet should be fluid for the first day or two, light and unstimulating for the first week, after that, if the patient is progressing favorably, she may return to her usual diet.

Hæmorrhage immediately after delivery is known as post-partum hæmorrhage; occurring two or three days later, it may be called secondary. It may follow even a perfectly natural labor, profusely enough to endanger life. There is little fear of it while the uterus is firmly contracted. If it is felt to be swelling, it is a sign of danger, and every effort must be made to induce contractions, which prevent the escape of blood by lessening the caliber of the blood-vessels. This symptom, and other indications of internal hæmorrhage, as pallor, coldness of the extremities, feeble pulse and respiration, must be watched for, especially when the patient is asleep, for fatal post-partum hæmorrhage may occur without any great show of blood. If the pulse gets above 100 at this time, some complication is threatening. If hæmorrhage occurs, elevate the pelvis somewhat, keeping the head low. Make pressure upon the fundus uteri, endeavoring to induce contractions of that organ. Make ice-cold applications externally, and inject hot water into the vagina. Give ergot.

Another peculiar danger to which this state is liable is that of puerperal fever, a form of blood-poisoning most commonly established within three or four days after labor, resulting either from absorption of the decomposing matter produced by the woman herself, or from infection brought to her from some external source. After the raw surfaces are healed over, and the os uteri closed, the danger is less, but antiseptic precautions ought still to be kept up. The disease is commonly initiated by chills, followed by high fever, the temperature rising to 102°, 103°, or even, in severe cases, to 106°. The pulse is rapid, the countenance sunken and anxious; there is a sickly odor to the breath, and usually diarrhœa and vomiting. The lochial discharge is suppressed, or becomes altered in character; the secretion of milk ceases. It is often complicated with peritonitis or metritis—inflammation of the uterus. The symptoms and severity are variable, but it is always dangerous and highly infectious. The treatment is like that of pyæmia, which it much resembles.

Another disease of the puerperal state, though not entirely confined to it, is phlegmasia dolens, or milk-leg, caused by obstruction of the femoral vein by a blood-clot. It results most commonly from exposure or over-exertion. The leg swells, and becomes intensely painful, the skin white and tense. There is often fever accompanying it, and sometimes chills. It is treated by absolute rest; support the limb comfortably, keep it warm by enveloping it in cotton wool, and the condition may be expected to gradually disappear, though it does not always terminate so happily.

Puerperal convulsions sometimes occur, resembling those of epilepsy. These are usually of a uræmic type, resulting from deficient action of the kidneys, and are very dangerous.

A form of insanity may follow labor, known as puerperal mania. It usually takes a melancholy form, often with a disposition to injure the child. It is acute while it lasts, but rarely permanent.

CHAPTER XXI.

Sick children—Early symptoms of disorder—Tact required in nursing them—Feeding infants—Dentition, and its accompanying disorders—Thrush—Ophthalmia—Colic — Diarrhœa — Constipation — Descent of the bowel—Worms—Incontinence—Cholera infantum — Convulsions—Croup—Whooping-cough—Mumps—Chicken-pox —Measles—Meningitis.

A VERY high degree of development of those qualities desirable in any nurse is requisite in the care of sick children. This calls for infinite tact, patience, and judgment, and especially is the habit of critical observation essential, for, with children too young to speak, the involuntary revelations of signs and gestures give often the only clew to the seat and kind of distress. The objective symptoms are, fortunately, very marked in children, and they respond to treatment with a readiness which makes them very interesting subjects. A good deal may be learned from the character of a baby's cry. With abdominal pain the cry will be long, loud, and tearful, subsiding, as the pain is relieved, into long-drawn sobs. The legs will be drawn up, to relax the strain on the abdominal muscles. If there is inflammation of the chest, there will be less profusion of tears and less noise, the cry begun after each deeper breath or cough will be sharp and suppressed, evidently augmenting the pain. Sharp screams, alternating with low moans or stupor, suggests some affection of the brain.

Waking suddenly with a cry, grinding the teeth, or starting nervously in the sleep, and boring the head into the pillow, are all noteworthy symptoms in children. No departure from the usual habits of the child is unimportant. Note whether it is unusually stupid, restless, or irritable, in what position it seems most easy, whether the light occasions distress, and whether the general symptoms of disorder increase in severity toward night. The temperature should be taken by rectum. If a child complains of pain anywhere, and has a rise of temperature, it is safe to examine the throat. The pulse of an infant can only be taken with any approach to accuracy during sleep. A very slow pulse is more ominous in a child than a rapid one. Children gain and lose flesh with great rapidity, showing it first on the inner side of the thighs, where two or three days' illness will have a marked effect.

In dealing with sick children the utmost gentleness is necessary. They ought never to be frightened or startled. It is a bad time to introduce a stranger to a shy baby when it is sick, and the first thing to be done —often a very difficult thing to do—is to acquire the child's confidence. Until it has grown used to your presence, it may be best to allow everything to be done for it by the mother or usual attendant, while you merely give directions. A child accustomed to unlimited indulgence, afraid of strangers, and fretful from pain, is not an easy patient to manage; it will require very winning tact and a genuine sympathy for the little one, to get even the possibility of caring for it helpfully. Whatever excites or alarms does the child harm, making it nervous and feverish. Do not give too many toys in the effort to divert, one at a time is better than a dozen; and, above all, do not let the child see any that it can not have. Children may be attacked by many of the same diseases as older people ; there are also some which are peculiar to them, and others which appear most frequently in early life. When a child first exhibits indisposition, it is always safe, and often soothing, to put it in a warm bath. This will tend to bring out any latent rash, for which the whole body should be carefully examined. The room should be warm and free from draughts, the temperature of the bath 100° Fahr., and the child allowed to remain in it about five minutes. If the baby is afraid of the water, prepare the bath out of sight, and cover it with a blanket. The child can then be gradually let down into the water, blanket and all, without any shock. When taken out, it should be wrapped in a soft dry blanket for a few moments, and then dried with soft towels. Guard against exposure, keep as quiet as possible, on the simplest diet, and watch carefully for further signs of disorder.

The only suitable food for a baby is its mother's milk ; or, failing that, the nearest approach to it that can be made. If it is necessary to bring up a child by hand, milk properly diluted is still the one thing to be given. Jacobi recommends the following : Boil an ounce of barley, ground in a coffee-mill, in a gill of water for fifteen minutes ; strain, add half as much boiled milk, and a lump of white sugar. When there is a decided tendency to constipation, oatmeal may be substituted for the ground barley. The use of cow's milk necessitates the addition of salt, and, if it has to stand for any length of time, a teaspoonful of lime-water should be put in each pint. The milk should be given at a temperature of 90°. The baby's bottle and mouthpiece should be well washed, and kept in water when not in use. If the food is rejected, either the child is overfed—a common source of trouble—or the food is unsuitable. If the mother's milk is, as sometimes happens, too rich to agree with the child, it may be diluted by giving first a little sugar and water, or barley water. Vomiting by an infant is rarely attended with much constitutional disturbance. If the milk is thrown up unchanged, the matter is more serious than if it is returned coagulated and sour. A child is often rendered restless by thirst, and will be quieted and relieved by a little clear cold water. After eight or ten months, the daily meals should not exceed six in number. An allowance of bread and milk, or beef-tea, may be given, but it should not come to depend upon solid food until all the teeth are cut. Contrary to the common impression, thick food is less nutritious than thin. The first teeth may be looked for at about the sixth or eighth month, and the others at intervals, until the first set of twenty is complete, at about the age of two years. The process of dentition is accompanied by various functional disorders. It unsettles the healthy balance of the system, and predisposes to, if it does not exactly cause, disease. The child will be restless and feverish; diarrhœa is common; sometimes even croup and convulsions occur. These need medical advice, as at other times, and great attention must be paid to general nursing and dieting. Keep the little one in the open air as much as possible, suitably clothed. If the gums are very painful and swollen, it will be necessary to have them lanced.

Thrush is a sort of fungoid growth appearing in the form of white spots on the tongue and inside of the mouth. It may result from improper food, or from neglect to wash out the child's mouth after eating. Particles of milk remaining in the mouth decompose, and set up fermentation. The disease is treated by touching the patches with honey and borax, or chlorate of potash in glycerine. It usually lasts for eight or ten days. Errors of diet should be corrected, and great attention paid to the cleanliness of feeding-bottles, etc. If it is allowed to spread, it may extend into the throat, and cause difficulty in swallowing, or even attack the stomach, when it may prove fatal. It is a serious indication if an eruption appears about the anus simultaneously with thrush in the mouth.

Ophthalmia.—A discharge from the eyes may occur in very young children, gumming the lids together during sleep, and inflaming them. This is very serious, and unless early taken in hand may result in loss of the eyes. They should be bathed, without rubbing, letting a small stream of tepid water trickle over them toward the nose. A little salt in the water will make it less irritating. Wipe all the discharge away with a soft bit of rag, which burn immediately, as it is highly infectious. For the same reason be careful about washing the hands afterward, and keep your fingers away from your own eyes. The danger of contagion is not confined to children.

The most common troubles of children are disorders, more or less severe, of the digestive tract.

Colic.—The wind-colic of infants seldom requires medical treatment. If persistent, it is probably due to unsuitable food ; or, in the case of a nursing baby, to indiscretions in diet on the part of the mother. Do not give soothing-syrups.

Diarrhœa.—When diarrhœa is present, a little calcined magnesia may be given, or boil the milk and add lime-water. Put a flannel band about the bowels, and be sure to keep the child warm. The skin is apt to become chafed and sore; scrupulous attention must be given to cleanliness. In place of soap and water, very thin starch may be used, and will be found soothing. Dry carefully, and dust with toilet-powder, or dry starch. If the diarrhœa is long continued, it will be very exhausting. Have medical advice, and do not give paregoric without it..

Constipation.—When there is a tendency to constipation, rub the bowels night and morning with warm olive-oil. Oatmeal-gruel will be a helpful diet. A small suppository of Castile soap will usually induce a movement. It is well to establish regular habits in children, and with a little pains it can be done very early, but it is most injudicious to urge them to strain until something has been accomplished.

Protrusion of the bowel may be thus caused. If it has occurred, lay the child on its back, with the hips elevated, wash the parts carefully in tepid water, and replace the bowel very gently. If it can not be done readily, the child must be kept quiet, and the doctor sent for.

Worms.—Delicate children are sometimes troubled by worms in the intestine. Round and pin-worms are the most common. The only reliable symptom is their presence in the stools. A dose of castor-oil may be given, and, after it has operated, injections of warm water and salt daily until the trouble is at an end.

Incontinence of Urine.—Nocturnal incontinence is a common trouble among children, and one for which medical advice is necessary. It should be cured before it becomes a confirmed habit, but scolding or punishing the child will not do it.

Cholera Infantum is one of the most fatal diseases among young children. It usually begins with diarrhœa or indigestion. It comes from over-feeding, heat, and impure air, and is aggravated by teething, though never caused by it. The child loses flesh rapidly, becomes restless and feverish, has intestinal pain, and excessive thirst, but no appetite, and the food is not assimilated. Medical advice should be summoned early. The child should be kept cool, and much in the open air. Entire change of air is advisable.

Convulsions in children may result from indigestion, worms, difficult dentition, fright, or any extreme nervous excitement. Muscular twitchings come on suddenly, sleeping or waking. The fits usually last only a few moments ; a succession of them is alarming. The doctor should be at once sent for, but treatment should not await his arrival. Remove the clothing with as little disturbance as may be, and put the child in a warm bath. Keep the head cool. An enema of soapsuds may be given, or a dose of castor-oil. If the temperature gets up to 103°, put in a cold pack.

Croup is an inflammation of the larynx and trachea. It may come on gradually, with a cold in the head, wheezing, hoarseness, and short, dry cough, or the child may be wakened in the night by sudden dyspnœa and violent choking. There will be a long-drawn inspiration, accompanied by a characteristic sound, a ringing cough, the voice will be husky, the skin hot and dry. There are two varieties—membranous croup, usually fatal, and spasmodic croup, rarely so. The treatment until the doctor arrives is in either case the same. Keep the temperature of the room not lower than 65°, and a tea-kettle boiling to moisten the air. If the breathing is labored, give an emetic—the syrup of ipecac in drachm doses is in common use—and repeat at intervals of half an hour until there is free vomiting. Give a hot bath. Hot stupes around the throat will sometimes afford relief. Prop the child up with pillows, and keep quiet, avoiding everything that will excite crying or coughing. Simple spasmodic croup usually yields readily to treatment, though the attacks are likely to recur, and the child must be protected with extra care for some days. Membranous croup is characterized by an exudation of false membrane in the throat, and is by many authorities considered identical with diphtheria. The early symptoms are much the same as above described; as the disease progresses, the child becomes dull, irritable, and disinclined to speak. The head is thrown back, the face distressed, and bathed in cold perspiration. In the last stages, stupor comes on, from which the child must be roused for nourishment. This can only be given in small quantities. Tracheotomy is sometimes resorted to.

Whooping-cough begins like an ordinary cold, the peculiar whoop not being heard until after the first ten days. It lasts from one to three months. The child should be kept out-of-doors if the weather is fit, and should have a light, unstimulating diet, special care being taken to avoid constipation. The chief danger is of bronchitis, or inflammation of the lungs, supervening.

In all diseases of the lungs or air-passages, the child should be kept quiet, in an even temperature, with pure air. The head should be well elevated, as the breathing will be less labored in a nearly upright position. The sputa will generally be swallowed by young children, and will sometimes be vomited up in quantity.

Mumps is another common juvenile disease, not very dangerous. It is an inflammation of the salivary glands, chiefly the parotid, and may affect one or both sides, together or successively. There will be pain and swelling under the ear, with difficulty in swallowing, or even in speaking. Hot applications will afford the most relief. If there is suppuration, which is rare, poultice. There will be more or less fever, and some slight laxative may be required. The disease reaches its height in three or four days, then declines rapidly.

Chicken-pox, or *Varicella*, commences with slight fever. After twenty-four hours an eruption of reddish pimples appears, generally thickest on the back. In a day or two these become vesicular, and within a week disappear. Little medication is called for. A warm bath may be of service. Isolate the patient if there are other children.

Measles—Rubeola—is a disease not confined to children, but most common among them. It begins like an attack of acute catarrh, with sneezing, coryza, hoarseness, sore throat, cough, dyspnœa, and some fever. The average period of incubation is eight days. The eruption comes out not later than the fourth day from the appearance of the first symptoms, in dark, somewhat crescent-shaped patches, first on the face, neck, and arms, later on the trunk and legs. This lasts from two to five days, then fades in the order of appearance, leaving a brownish stain and mealy desquamation for a week. At this time diarrhœa is apt to set in. The disease itself is not likely to be severe in a child, but is often complicated or followed by bronchitis, pneumonia, gastric troubles, ophthalmia, or otorrhœa—inflammation of the ear. To avoid such sequelæ, great care is required, even after convalescence is established. The child should be kept in bed, and on light diet, until all feverishness has left it. Great warmth is not required, but protection from draughts is important. The eyes should be shielded from strong light, and care be taken not in any way to strain them. A generally lowered tone of the system may persist for some time.

Roseola, or *German Measles*, is a fugitive eruption, lasting a few hours or days, very mild, but supposed to be contagious. A second attack of either this or true measles is rare.

Acute Meningitis is a disease also most common in children under five years of age. The symptoms vary very much. It most often comes on gradually, with wasting of the body, disordered bowels, capricious appetite, nausea, headache, fever, irritability, intolerance of light and noise. The child may seem constantly drowsy, but the sleep is restless and disturbed. Squinting and enlarged glassy pupils are common symptoms. As the disease progresses, convulsions or paralysis may occur, or the patient sink into a comatose condition. Perfect quiet is an essential part of the treatment. Keep the child in a dark room, in bed, with the head elevated. Do not rock or walk about with him, or in any way move him unnecessarily. Do not startle or excite him. Cold applications to the head will probably be ordered, and purgatives. Only the lightest food should be given.

CHAPTER XXII.

Special medical cases — Bronchitis — Pneumonia — Other pulmonary troubles—Asthma—Diphtheria—Peritonitis—Strangulated hernia —Bright's disease—Diabetes—Dysentery—Cholera morbus—Cholera—Typhoid fever—Typhus—Scarlet fever—Small-pox—Acute rheumatism—The use of stimulants in fevers—Restraint in delirium—Delirium tremens.

THERE are a few special diseases for the care of which some special directions may be needed, supplementary to the general directions for nursing in all cases. Although a slight attempt is made at describing them, it is not to be expected that any given case will correspond exactly with the type except in general features. Variations and complications are endless, and clinical diagnosis is not expected of you, but you will find it an advantage to know what course a disease naturally takes, and what dangers are especially to be guarded against.

Bronchitis is an inflammation of the bronchial tubes, acute or chronic. Capillary bronchitis is the most dangerous form. The acute disease begins with a heavy cold, sometimes ushered in by slight chills. There is fullness in the head, sore throat, general malaise, with pain in the chest and cough, at first dry and then accompanied by watery sputa, which later become viscid and purulent. As the dyspnœa increases, there may be high fever, rapid pulse, and profuse perspiration. The patient must be kept in one room, well aired, at an even temperature not higher than 65° Fahr. Free action of the skin is to be secured, and the bowels opened. A mustard plaster on the chest may relieve the pain, and inhalations of steam allay the cough. Full diet may be allowed.

Pneumonia, inflammation of the lung substance, is one of the most serious of the pulmonary affections. One or both sides may be affected, more often the right lung alone. It is usually initiated by a chill, or sense of chilliness with deep-seated pain, and shortness of breath. High fever follows with flushed face, often of one side only, headache and restlessness. The cough is short and hacking, the expectoration at first scanty. After twelve or eighteen hours, it may be expected to increase in quantity, and to assume a tough tenacious quality, highly characteristic. It may be rust colored or streaked with blood. The sputa should be carefully preserved for the doctor's inspection. The disease reaches its height by the end of the first week; in those cases which terminate by resolution—gradual restoration of the inflamed part to a normal condition—the febrile symptoms rapidly decline. When suppuration takes place, the fever is likely to continue a week or two longer. The great danger is failure of the heart. The patient must be kept in bed, absolutely quiet, and on fluid diet. Be careful not to overload the stomach. Save his strength in every possible way; do not allow unnecessary talking, or any exertion. Convalescence, once established, will be rapid. An oil-silk jacket is often ordered to protect the chest. This should be lined throughout with flannel, and should extend from the neck to the lower ribs, fitting snugly. The safest way to remove this is by cutting off an inch from the bottom every day.

Pneumonia often occurs in combination with bronchitis and with *pleurisy*. The latter is an inflammation of the pleura, the serous membrane covering the lungs, and is intensely painful. Empyema is a variety of pleurisy characterized by an accumulation of pus in the pleural cavity. Pleurodynia is a rheumatic affection of the muscles of the thoracic wall. Tubercular phthisis is a disease characterized by a morbid deposit in the lung.

Asthma is a form of dyspnœa, caused by spasmodic contraction of the bronchial tubes, for which you should know the popular remedies in case of emergency. It is rarely dangerous but always distressing. The patient gasps violently for air, his expression anxious, pulse feeble, the skin cold and pale or cyanosed. Elevate the arms, and give all the air possible. A drachm of Hoffmann's anodyne may be administered, and repeated after half an hour, if the condition is not relieved. It may last for several hours, and is usually concluded by a paroxysm of coughing, and a free expectoration of mucus. Blotting-paper which has been saturated with a strong solution of saltpetre, and dried, affords, when burned, fumes that may give relief ; stramonium leaves rolled into cigarettes, or smoked in a pipe like tobacco, are sometimes ordered.

Another spasmodic affection of the respiratory organs is *laryngismus stridulus* or false croup. This is laryngitis with spasm of the glottis, and is almost exclusively a disease of childhood. True croup is laryngitis with an exudation of lymph.

Diphtheria is a form of blood-poisoning, often resulting from imperfect sewerage. It is first manifested by feverishness, symptoms of a cold, difficulty in swallowing, and swelling of the tonsils, followed by an exudation of false membrane in white patches on the throat. The discharge from the mouth and nostrils is likely to be abundant; it should be wiped away on soft cloths and immediately burned, as it is highly infectious. Take every precaution against infection, and follow all orders to the letter. Give plenty of fluid nourishment. Nutritive enemata may be necessary. The patient may be choked by the obstruction of the throat, but as great a danger is of paralysis of the heart, which may occasion a fatal termination, even after convalescence from the disease is well established. The horizontal position must be maintained for a long while. Tracheotomy is sometimes resorted to, but there is danger that the membrane will continue to form below the point of incision.

Peritonitis, inflammation of its lining membrane, is one of the most painful and dangerous diseases attacking the abdominal cavity, almost invariably the result of some internal injury. It is characterized by severe pain, great depression, and high fever. The pain resembles that of colic, but the latter moves about from point to point, is not accompanied by fever, and is relieved by pressure, whereas pressure, even of the bedclothes, is unendurable with peritonitis. The abdomen is swollen and tympanitic. The patient lies on his back with his knees drawn up, the whole attitude and appearance indicative of suffering. There is obstinate constipation, often vomiting, sometimes retention or suppression of urine. Any applications ordered to the abdomen must be very light. Hot fomentations will sometimes be grateful. The patient should not be allowed to make any effort to relieve the bowels. Suppositories of opium will usually be given. Feed sparingly and with great care.

Strangulated hernia is another alarming intestinal difficulty marked by obstinate constipation, intense pain, and vomiting first of the contents of the stomach, and later of stercoraceous matter. There will be extreme prostration, and, unless relief can be obtained, finally collapse. Operative measures are called for.

"*Bright's disease*" is a generic term including several varieties of kidney trouble, presenting albumen in the urine. The condition described as acute Bright's disease commonly results from taking cold, or as a sequel of scarlet fever, diphtheria, or rheumatism. The urine is frequently passed, but diminishes in quantity and becomes albuminous; often containing also microscopic casts. There is a peculiar waxy complexion, and a general dropsical condition, evident at first about the eyelids and in the feet. Headache, gastric disorders, and general debility may be looked for; bronchitis and heart disease are frequent complications. Suppression of urine may follow, leading to death by uræmic convulsions or coma, or the disease may terminate in recovery, or develop into a chronic form. The danger is great. The waste product must in some way be carried off; for this purpose, the skin is excited to action, the bowels are kept open, and diluent drinks and diuretics given. Hot-air baths are often prescribed, and sometimes a skimmed-milk diet. Only the most digestible food can be allowed, and that must be given with the utmost regularity.

Diabetes mellitus is characterized by an excessive flow of urine containing glucose, or grape sugar, an ingredient never found in any considerable quantity during health. The condition comes on by degrees, is more frequent among men than women, and at middle age. The symptoms are extreme thirst and abnormal appetite, especially for sweets, but loss of flesh and strength, a dry skin, furred tongue, bad breath, and intestinal disorders. Is most alarming when complicated by lung troubles. The chief treatment is by dieting. Everything containing sugar, or starch, convertible into it, should be prohibited. The doctor will give you a list of the allowable articles, and you will have to see that your patient does not get sugar surreptitiously. He should have regular exercise, and take special care about catching cold.

Dysentery is an inflammation of the mucous membrane of the large intestine. It may be preceded by various digestive disorders, abdominal tenderness, a sense of chilliness, and a rise of temperature at evening. It usually begins with diarrhœa, followed by tenesmus, which is the characteristic symptom, griping pain, and discharge of mucus from the bowel, streaked with blood, and lacking the healthy fæcal odor. Ventilate freely, and disinfect the stools. Keep the patient flat on his back, warm and quiet. Put a broad flannel bandage around the abdomen. Give ice *ad lib.*, but little water. Feed on boiled milk, corn-starch, rice-flour, arrow-root, etc., not very hot. The inflammation may lead to ulceration or sloughing of the intestine, and death from collapse.

Cholera morbus, or sporadic cholera, is usually caused by indigestible food or impure water. It exhibits many of the appearances of the epidemic disease, but is comparatively harmless, being rarely fatal, except among infants. There will be vomiting and purging, with violent intestinal pain and cramps, faintness, and a tendency to nervous shock. Encourage rather than check the clearing out of the system, which is an effort to get rid of some irritating matter, apply hot poultices or stupes to relieve the pain, and recovery will usually be spontaneous. Keep the extremities warm, and stimulate moderately if required. Give but little and light food, only gradually returning to solid diet.

Asiatic cholera is a specific infectious disease, communicable by means of the excreta. It is characterized by violent vomiting and purging, with so-called "rice-water evacuations," cramps, extreme prostration, and collapse. It usually commences with slight diarrhœa and nausea, and, wherever the disease prevails as an epidemic, these symptoms should receive prompt attention. If it progresses, there is intense thirst, restlessness, and muscular spasm, the pulse becomes rapid and weak, the temperature falls below normal, the skin becomes livid, the eyeballs sunken, and a generally ghastly appearance precedes death by collapse. The mind is usually clear to the last.

The first endeavor is to control the purging, for which opium is usually given. Keep the patient in bed and warm. In all cases of diarrhœa, especially in cholera, insist on the recumbent position. Give ice *ad lib.*, but little water ; food strictly as directed. Nutritive enemata may be necessary. The stools, vomited matter, and urine, must be disinfected most thoroughly, and disposed of promptly, and all possible precautions taken against the spread of the disease.

Typhoid, or *Enteric, fever* is due to a poison associated with certain forms of decomposing animal matter, and is characterized by a catarrhal inflammation of the mucous membrane of the small intestine. It is most common in early adult life, and during the latter part of the year. It may occur as an epidemic, in which case there is some common cause to be looked for and remedied. The period of incubation is from two to three weeks, the usual duration from three to four weeks, dating from the first rise of temperature.

The attack most often comes on gradually, beginning with dull headache, loss of appetite, general malaise, sometimes nausea and slight diarrhœa, and nose-bleed. The patient may not go to bed till the fifth or sixth day, though the fever steadily increases during the first week, having a remittent type, falling in the morning, but rising every night a little higher, till it gets up to 103° or 104°. By this time there is violent headache, intolerance of light, and, perhaps, slight delirium, parched lips and tongue, abdominal tenderness and tympanitis. During the second week the fever remains continuously high, and an eruption of rose-colored spots may appear on the abdomen and chest. These are slightly elevated, and disappear upon pressure, to return again immediately. Each spot remains visible for three days. Successive crops may appear for ten or twelve days. The headache is less during the second week, the bowels are likely to be relaxed, the motions of a light ochre or "pea-soup" color. In severe cases, the patient assumes a characteristic typhoid appearance, the face dusky and indifferent, the muscular prostration evidently extreme, the mental condition one of stupor, varied by active delirium. The tongue is brown, dry, and heavily coated; sordes collect on the teeth. During the third week the fever again becomes remittent, falling toward morning, though rising at night. The general typhoid conditions deepen, the pulse becomes frequent and feeble, the emaciation and loss of strength rapid. This is the period of greatest danger. By the beginning of the fourth week there should be evident improvement, the fever becoming intermittent, and the evening exacerbations decreasing, the tongue clearing off, and the tympanitis disappearing. There will now be a return of the appetite, and natural sleep. Constipation is common. When the temperature keeps a steady normal, convalescence may be regarded as fully established. The strength begins to return, and the appetite becomes sharp. Convalescence is always slow, and likely to be complicated. There may be relapses, usually milder than the original attack, and of shorter duration, but running a similar course. The greatest danger in typhoid is of perforation of the bowel by the intestinal ulcers, and consequent acute peritonitis.

The symptoms of perforation are sudden diarrhœa, severe pain, increased by pressure, rapid distention of the abdomen, rapid, feeble pulse, and other signs of collapse. It is usually fatal within twenty-four hours. Intestinal hæmorrhage may occur without perforation, from the rupture of an artery in some ulcer. It is usually preceded by a sudden fall in temperature. It may be serious enough to be fatal, without any escape of blood to the surface. The treatment consists of absolute rest, an ice-bag to the abdomen, and semi-narcosis by opium.

In no case is good nursing of more vital importance than in typhoid fever. There must be constant watchfulness and care from the beginning until complete recovery. The recumbent posture must be strictly maintained until the intestinal ulcers are perfectly healed. The diet must be rigidly in accordance with the doctor's directions, even after the patient feels quite well. Many deaths occur from indiscretion or over-exertion during convalescence. There is no specific treatment; little medicine will be given; everything depends upon hygienic precautions and economizing the patient's strength until the disease is exhausted. The patient must be kept clean and dry—there is great danger of bed-sores with the extreme emaciation—but in no way fatigued. Wash the mouth and teeth several times daily, and give cold water in small quantities even if not asked for. Keep the temperature of the room at 60° while the fever is high. The stools need to be disinfected with the same care as those of cholera, for the poison passes out in them, and is readily communicable.

Typhus fever resembles typhoid only in name. It is a highly contagious disease, associated with over-crowding and bad ventilation. The attack is usually abrupt, beginning with a chill, followed by a temperature of 105° Fahr. or more, with violent headache and extreme prostration. The rash appears toward the end of the first week, showing first on the sides of the abdomen in dirty pink or purplish spots. When abundant, it is described as "mulberry rash." Each spot persists until the disease terminates in convalescence or death. The head is much affected; violent delirium occurs, or in some cases coma-vigil. The disease, unless it terminates fatally, usually runs for fourteen days, after which the amendment will be abrupt, as was the onset. Relapses are rare. The patient's strength must be saved in every possible way, the aim being to sustain the vital powers until the fever abates. Watch every moment during the delirium. Keep ice-bags on the head. The sleeplessness must in some way be relieved, and nourishment must be given, if by force. Quarantine strictly. Ventilation is especially important, as the poison is thrown off most virulently from the lungs and skin. Fresh air is the best remedy, regardless of cold.

Scarlet fever has a period of incubation anywhere from two to ten days. It begins with headache, nausea, sore throat, pains in the limbs, rapid pulse, and rise of temperature, more rarely with chills or convulsions. The eruption generally appears on the second day—rarely later—beginning on the chest, a bright efflorescence, rendered pale by pressure, but immediately returning. It is most distinct at the bends of the joints. The danger is somewhat proportionate to the darkness of the eruption, but there is a very malignant variety, rapidly fatal, with no eruption at all. The rash lasts from four to six days, and as it declines desquamation sets in. This is the most infectious period, and the isolation must be complete until it is fully over, and even for a week later. The most severe cases may follow exposure to a light one. With high fever may be the characteristic "strawberry tongue," and sore throat, occasioning difficulty in swallowing. The tonsils sometimes ulcerate. Hot applications about the throat may relieve it. Various complications are common, and there is no disease in which there is greater liability to troublesome sequelæ. Kidney troubles, rheumatism, diphtheria, inflammation of the joints, and deafness from the ulceration extending into the Eustachian tubes, are all likely to follow. The greatest care should be taken not to let the patient get chilled during convalescence; the skin is especially sensitive while desquamation is going on, and, if its action is suddenly checked, the extra work thrown on the kidneys is almost sure to induce inflammation of those organs. Even the slightest cases should be kept in bed, and protected from the least exposure. However well the patient may appear, watch the urine carefully, and test it now and then for albumen. Should it become scanty, smoky, or over-abundant, it is an indication of danger. Note whether the limbs swell, and if there is any difficulty in breathing. If diphtheritic trouble is impending, there is likely to be free discharge from the nose.

Very little medication is now employed for these cases. Keep up good sanitary conditions, fresh but not cold air, food as directed. Cold water may be given freely. During desquamation, the body may be sponged off frequently with tepid or warm water, and rubbed with vaseline or cacao-butter, to allay the irritation.

Scarlatina is not, as commonly supposed, a lighter form of the disease, but merely its Latin name.

Small-pox, or *Variola*, begins with great severity from nine to fourteen days after exposure, usually with a chill, followed by high temperature, rapid pulse, general feeling of lassitude, severe pains in the back and legs, vomiting, sore throat, tongue white and furred. The rash appears punctually on the third day, in small spots like flea-bites, first on the face and neck, along the edges of the hair, then extending downward. When the rash comes out the febrile symptoms subside. The pimples become vesicular, showing a depression in the center, and about the fifth or sixth day suppurate. With the suppuration the high fever returns, often preceded by a chill. The vesicles have a marked and characteristic odor. They increase in size, and may become confluent, running together, or remain discrete, distinct. The confluent variety is by far the most dangerous. By the ninth day they reach their full size and burst, or crust over, and desiccate. The secondary fever then subsides, and convalescence is established. Another high rise of temperature would be suggestive of some complication. The danger in small-pox is greatest at the beginning of the suppurative fever. The more abundant the eruption, the greater the danger. The pain attending the eruption may be relieved by hot fomentations. When the vesicles begin to be prominent, they may be pricked, and bathed with some weak disinfectant solution. On the palms and soles, where the skin is thick, they should be opened early. During desiccation, sponge with warm water, and oil the surface freely. Ventilate well. Keep the room dark, and its temperature down to 60°. If there is delirium, apply ice to the head. Children must be kept in gloves. The throat may be so inflamed as to render swallowing difficult. But try to keep the patient's strength up, and his temperature down, and isolate completely. He must not come in contact with others till every trace of a scab has disappeared. Infection may take place during any stage, even that of incubation. Vaccination, properly performed, is perfect protection. Varioloid, a modified form, may result from exposure after vaccination, running a similar course, but milder, and of briefer duration.

Inflammatory rheumatism, or acute rheumatic fever, usually results from exposure to cold and damp. It may possibly, when latent in the system, be developed by malarial poisoning. The fever often runs high before the local symptoms appear. These are heat, redness, swelling, and intense pain in one or more joints, having a tendency to shift about from one spot to another. There is profuse perspiration, having a characteristic odor. The urine is likely to be scanty, high colored, and strongly acid. Nervous disorders and mild delirium at night may accompany severe cases. The greatest danger is of cardiac complication. A horizontal position should be maintained, and the patient lifted as little as possible, as the slightest motion is agonizing. He should be kept warmly dressed in flannel. The bowels should be kept open, and only light and digestible food given. Avoid all excitement, and in no case give stimulants except under the doctor's direction.

In giving stimulants in fevers, note the following points : If, after taking, the tongue and skin become moist, the pulse steadier, the breathing more tranquil, if delirium is quieted, and sleep induced, they may be recognized as helpful, and their use continued if called for. If the reverse effects follow, the skin and tongue becoming dry, the pulse quicker, the breathing hurried, they are doing harm, and should be stopped.

In violent delirium restraint must be effectual, or it only aggravates the trouble. A dry sheet put on like a pack will take the place of a straight-jacket if needed, but with proper attendance physical restraint is seldom necessary, and should be avoided when possible. Avoid every appearance of fear ; keep the room quiet and dark. The same remarks apply to the care of insane patients, who should be allowed as much freedom from restraint as is compatible with safety. Divert rather than oppose them ; be gentle and forbearing, but at the same time firm and vigilant. With a patient of unsound mind it is never safe to be off guard for an instant.

Delirium tremens is a peculiar type, the result of chronic alcoholic poisoning. It is marked by a nervous tremor, great anxiety and restlessness, and horrible hallucinations. Insomnia and suicidal mania are common. The pulse is feeble, the skin cold, and often bathed in perspiration, the pupils minutely contracted, but with no intolerance of light. The bowels must be kept open, and nourishing food given, even if by force. The nervous prostration and inability to take food may become extreme, and the case end fatally, or it may terminate with profound sleep and spontaneous recovery.

CHAPTER XXIII.

The terminations of disease — Care of convalescents — Clothing — Visitors—Preparations for the night—Death—Signs of approach —Condition of body after death—Preparations for burial.

Disease may terminate either by complete restoration to health, by subsidence into a chronic form, by a lapse into some other disease, or by death. When the seat of disorder is suddenly transferred from one part of the body to another, the change is called metastasis. Convalescence may be abrupt or gradual, it may go on steadily, or be delayed by complications or interrupted by relapse. Sudden convalescence is most common in nervous affections, while in nearly all acute diseases it is established by gradual resolution.

The care of a convalescent is not the least wearisome kind of nursing, although it does not involve the hardest work. You miss the exciting interest which sustained you during the crisis of danger, yet, even if you are already fatigued, your watchfulness must not be relaxed, for the patient will be left more than ever to your responsibility, while he is more likely to risk imprudence and relapse. Convalescents are very apt not to realize their own weakness, and to want to do more than they are really able. You must see that they do not over-exert themselves in any way. A patient beginning to improve will at first be allowed to sit up in bed, then may be lifted to an easy chair or a sofa for a short time—perhaps an hour at first—gradually increased each day. Then he may walk across the room, or into the next room, and be taken out for a quiet drive on a bright day. The time when an invalid is first allowed to leave his bed is one when special care is required. All the clothing should be well aired and warmed. If the patient has something bright and pretty to put on, it will make him feel better, though anything elaborate and difficult to get into is objectionable; everything should be loose, easy, and not cumbersome. A wrapper with a heavy train will be enough of a burden to fatigue a feeble woman and prevent her from walking as much as she otherwise might. Walking is less fatiguing than standing. The room should be warmer than when the patient is in bed. Let him sit where he can see the fire, unless the eyes are weak, but not too near. To provide against a draft under the legs, put a blanket in the easy-chair, reaching well to the floor, which can be folded up over the feet. A footstool is always desirable.

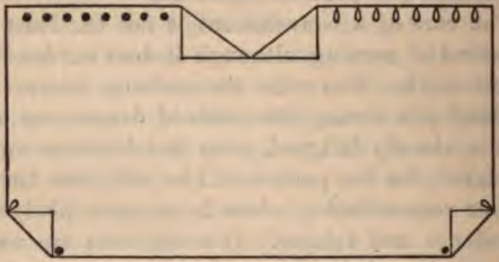


Fig. 13.

When the patient only sits up in bed, some extra covering will be needed about the shoulders and chest.

For this purpose a loose flannel jacket is much better than a shawl, as it does not confine the arms or slip off. The "Nightingale" wrap is a very convenient and easily adjusted shape. For this, two yards of flannel of the ordinary width are required. Cut a straight slit six inches deep, in the middle of one side, turn back the points so formed for a collar, and those of the corners farthest from it for cuffs; bind or pink it around the edges, and add buttons and button-holes, as illustrated in the diagram. It can be made as ornamentally or as simply as desired.

The patient, upon first getting up from an acute disease, should not be allowed to receive visitors, as the unwonted exertion is in itself as much of an excitement as is safe. It is best to have no one in the room but yourself and your patient, unless you need an assistant.

You should have full authority on the question of visitors, and it will be often your duty to protect the patient from his friends. Do not let him feel obliged to receive every one who calls. An invalid can always be politely excused. Some visitors will be unobjectionable, and even good for him, while others, with equally kind intentions, will do all the harm possible. Do not let anybody stay too long, nor admit too many at a time. Three in succession will be less wearisome than two at a time, who claim divided attention. Provide a seat for the visitor, facing the patient, so that he can see and hear without effort. Do not give the patient's easy-chair, nor let the visitor stand at the foot of the bed, or lean against it. A small table at the foot of the bed, with a few things on it, is an excellent arrangement to prevent this, and to keep people from taking hold of the bed and jarring it as they pass.

See that visitors do not smuggle in contraband articles. It is not only in hospitals that there is danger of this, though it is a most common trouble there. You may find all your work undone by some injudicious gift which you only discover too late. A handful of fresh flowers, a new picture, or some pretty decoration for the room, is always a better token of remembrance to send an invalid than delicacies to eat, which are very likely to be unsuited for him.

No visitors should be admitted after dark, as a rule. As night approaches, you should try to get the patient into a quiet, unexcited state of mind. It is not advisable to hush every sound as soon as he drops asleep, for absolute quiet is very hard to maintain, and slight noises will be less likely to disturb him if he is accustomed to sleep through ordinary sounds. If you are obliged to wake him, do not rouse him suddenly or sharply. You will seldom have occasion to do it at all. You should not wake a sleeping patient for anything unless by special orders. In the great majority of cases, healthy sleep is a better restorative than any you can administer. This does not apply to the insensibility of stupor.

Before settling down for the night, see that everything likely to be needed is where it can be readily found. Have food and fuel enough to last through the night; matches and a candle at hand, if a night-light is not kept burning. In the latter case, see not only that the light is carefully shaded, but that there are no reflections of it to shine in the patient's eyes. Dress yourself for the night in a warm wrapper, not a shawl, and easy, noiseless slippers. A nurse should be warranted not to snore.

If the patient expresses any wish to see a clergyman or a priest, he should be sent for, especially if there is any apprehension of death. If he is very sick, it is no time for religious exhortation, and any excitement should be avoided ; but, if the clergyman has any tact and sense of propriety, his visit may be a comfort to the patient, as well as to his friends.

The friends of the dying might be spared much anxiety if they realized how seldom the severance of soul and body is attended by any agony. To many a weary sufferer death comes as a glad release from the burden of pain, and even where the patient has clung to life, and seemed to fear the end, it comes almost always peacefully and painlessly. Death itself—the last ebbing of the vital force—is not painful, even though intense suffering may have preceded it. Death-bed scenes are rarely either edifying or agonizing, though always solemn.

Death approaches through one of the three vital organs, the heart, lungs, or brain—by asthenia, apnœa, or coma. Among the signs of approaching dissolution, are coldness of the extremities, a certain sharpness of the features, a dusky shade about the face and finger-nails, cold perspiration, restlessness, and muscular twitchings or stupor.

Do not unnecessarily alarm the friends ; but, when you are sure that the end is near, it is best that they should be informed. Disturb the dying as little as possible, though you must not give up working while there is the slightest ground for hope. Note the exact time at which death takes place, and take care not to announce it prematurely. The failure is sometimes so gradual as to lead to error in this respect. In a hospital, the attending physician, if not present, must be notified at once. After a few hours there can rarely be any doubt whether or not death has taken place. The only condition at all likely to be confounded with it is that of catalepsy, which is most often associated with hysteria.

Shortly after death there may be a high rise of temperature, produced by chemical changes within the body, but it soon assumes the temperature of other inanimate objects, and the *rigor mortis* sets in—a peculiar stiffening of the muscles. As a rule, the sooner it comes on, the quicker it disappears, leaving the limbs quite lax. Before it takes place the body should be prepared for burial. Wash it with a weak solution of carbolic acid, or chlorinated soda, close the eyes, arrange the lips naturally, and smooth the hair. Bandage the jaw closely, and straighten the limbs, tying the feet together with a broad tape or a bandage. Stuff all the orifices of the body with absorbing cotton, to prevent discharges, and bind a cloth firmly around the hips, putting it on like a child's diaper. Over this can be any clothing desired ; a clean night-dress or a simple shroud is more suitable than anything else. Cover face and all with a sheet. If the death occurs in a hospital ward, all this must, of course, be done behind screens. Do not send for the stretcher to remove the body until every thing is quite ready, and then have it taken away as quickly and quietly as possible. Have the door of the opposite ward closed. See that the patient's name is on the shroud.

In a private house, the final arrangements will all be put into the hands of an undertaker, but it is quite likely the friends will wish you to superintend them, and perhaps even lay out the body. If it is to be kept for any length of time it must be packed in ice. After twenty-four hours on ice the body assumes a much more natural appearance. Any slight discolorations can be made less conspicuous by dusting them over with toilet powder. After the body has been taken out, the room must be put in order, all the appliances of sickness removed, the bedding sent out to be disinfected, and the windows left wide open for twelve hours.

QUESTIONS FOR REVIEW AND EXAMINATION.

CHAPTER I.—1. What is nursing? 2. Why is the subject one of general interest? 3. Why do nurses need special training? 4. What objection has been made? 5. Was this prejudice well founded? 6. Does it still exist? 7. What can you do to overcome it? 8. Is there any danger that a nurse will learn too much? 9. What should be the limit of her studies? 10. Name an essential point of difference between the trained and the untrained nurse. 11. Define health. Disease. 12. What is the tendency of nature? 13. What is the object of medical treatment? 14. What is the vocation of the nurse? 15. Who will make the most successful nurses? 16. What is comprehended under nursing? 17. Can every good woman be trained into a good nurse? Why not? 18. What qualifications are important? 19. Is there such a thing as a natural gift for nursing? 20. How far is it valuable? 21. What class of women are most needed in the nursing field? 22. Is there room in this work for the exercise of much talent? 23. What traits are indispensable for a good nurse? 24. Which one do you consider most necessary? 25. What temperament is to be preferred? 26. What habits must be cultivated? 27. Name two classes of women unfit to become nurses. 28. For whom are the instructions in this book intended? 29. What is understood to be the first consideration of a nurse? 30. How may the duties of a nurse be classified? 31. Which duties take precedence? Why? 32. Do you owe anything to the school in which you are trained, after your direct connection with it ends? Why? 33. What duties do you owe to yourself? 34. Can you be released from these at your own will? 35. How are you to insure your permanent efficiency? 36. Specify some precautions that you should take. 37. Have you any duty toward other members of your own profession? 38. What is your first duty to the doctor? 39. What is the extent of your responsibility? 40. Are you ever justified in digressing from the doctor's orders? When? 41. Mention some particular instance in which you would depart from your instructions. 42. Should your personal opinion, as to the orders given, in any way affect your fidelity in their execution? 43. If you are forced to act upon your own discretion, what should you always try to do? 44. Does loyalty to the doctor include anything beyond literal obedience? 45. In what other ways can you help him? 46. What should be the relation between you? 47. Is it ever right for you to conceal anything from the doctor? 48. If you make mistakes, what is to be done? 49. What are your duties toward the patient? 50. Can their limits be defined? 51. Name some necessities common to all cases. 52. How much attention is to be paid to your own appearance? 53. What style of dress is most suitable for a nurse? 54. What care do the hands require? 55. What should be the character of the touch? 56. If you have cold hands, how can you remedy it? 57. What will you do if your patient objects to being made clean? 58. Is this ever likely to occur? 59. Is there any ground for the popular notion that clean clothes are unsafe? 60. What are you to do when your will conflicts with that of the patient? 61. Ought you ever to use positive authority? When? 62. How far may you yield to the patient's whims? 63. In what respect is amateur nursing apt to be faulty? 64. What advantage has a stranger in the sick-room? 65. What disadvantage? 66. Is there any danger that you will lack in tenderness, when you have no personal interest in the patient? 67. Is your professional interest in him as a "case" any safeguard against this? 68. What allowance can you make for an irritable and unreasonable invalid? 69. Can ill temper be regarded merely as a symptom? 70. How should diseased fancies be dealt with? 71. How can you be sure that they are unfounded? 72. What can you do toward keeping a patient's nerves in good condition? 73. Do you think it justifiable to conceal important matters from him? 74. What should you try to secure for him? 75. Upon what subjects should he be allowed to decide? 76. When you are in doubt yourself, whom are you to consult? 77. What should you endeavor to learn? 78. Why not nurse simply by rule? 79. Ought you to take advice from anybody else than the doctor? 80. About what matters? 81. Is it possible to be too self-reliant? 82. After your course of training is ended, will there be anything left for you to learn? 83. Where will you learn more? 84. What will you have learned at school? 85. In private nursing, what may you expect from the patient's friends? 86. How can you be sure that everything is properly done in your absence? Are you still responsible? 87. Are you at liberty to leave a case at any time? 88. If you have not sufficient help, what should you do? 89. Are you bound to stay with a case indefinitely? For how long? 90. To what is a nurse especially bound by honor? 91. Is the obligation the less because tacit? 92. Should the case of one patient ever be used for the entertainment of another? 93. How can you amuse your patient? 94. Should there be any difference made in the treatment of hospital patients? 95. Are you equally bound to honor and fidelity?

Chapter II.—1. Upon what does the comfort of the invalid largely depend? 2. What provision for illness is it desirable to have in every house? 3. Will a nurse always—or often—find her patient in suitable surroundings? 4. If not, how can she remedy the matter? 5. Of what use is it for her to know what a perfect sick-room should be, since she can rarely secure it? 6. What are the characteristics of a model sick-room? 7. For what reasons is space important? 8. On which side of the house should the sick-room be? Why? 9. Is light always a desideratum? Give exceptions. 10. How many windows should there be, and of what kind? 11. What are to be guarded against in the admission of light? 12. In what part of the house would you prefer the sick-room? 13. What advantages has the upper part? What disadvantages? 14. How can you avoid jarring the room? 15. How would you treat stationary basins? 16. What should there be adjoining the sick-room? 17. What should be kept in it? 18. What is said of the custom of keeping medical appliances about the sick-room? 19. When should they be seen? 20. Are plants and flowers allowable? 21. What care must be given them? 22. What can be done to make the sick-room cheerful? 23. What kind of walls are best? 24. What objection to whitewash? To paper? 25. What is scrupulously to be avoided? 26. What kind of curtains would you have? 27. Is a carpet desirable? What is better? 28. Why are all woolen materials objectionable? 29. How can you keep a carpet clean? 30. What are the essential furnishings of a sick-room? 31. How might you improvise a screen? 32. What may take the place of a table for the patient? 33. What kind of wood-work should there be? 34. Why is it especially important to have everything about the room in good repair? 35. What can be done toward keeping the room quiet? 36. Why is this important? 37. How can you put coal on the fire without disturbing the patient? 38. What sound should never be heard in the sick-room? How avoid it? 39. What kind of noise is most trying to the nerves? 40. What points are to be observed in speaking to your patient? 41. Upon what does good nursing largely depend? 42. Is anything to be considered trivial in the sick-room? 43. What will a good nurse be willing to do for her patient? 44. Is housework a part of her duty? 45. Can the limits of her work be defined? 46. To what must she adapt herself? 47. What will she do where there is insufficient service? 48. Is this often the case? 49. How do the difficulties in private nursing compare with those of hospital work? 50. What simplifies the latter? 51. Give an outline of the ordinary work in a hospital ward. 52. How far is the head nurse responsible for the conduct of the ward? 53. Is any help to be looked for from the patients? 54. What is to be done in the wards before the doctor's visit? 55. Whose duty is it to attend the doctors during rounds? 56. What questions must the nurse in charge be prepared to answer? 57. What else has she to do? 58. What are the other nurses doing during rounds? 59. What is to be done after rounds? 60. Where should the nurses spend their hour off duty? 61. Tell what is to be done when a new patient is admitted. 62. Why is it advised to take the pulse and temperature twice? 63. To whom is the night nurse responsible? 64. Are her duties more or less important than those of the day nurses? 65. What reports must she make? 66. How late should she stay in the ward? 67. How can hospital work be made to go smoothly? 68. What sentiments should exist among the nurses? 69. Is the care of the room as important as in a private house? 70. What is the first requisite in a hospital ward? 71. Why is dirt more dangerous there than elsewhere? 72. How can it best be removed from the floor? From the furniture? 73. What should not be dusted with a damp cloth? 74. What is the use of a feather duster? 75. When should the slop-pail be brought into the ward? 76. What special care do the lavatories need? 77. What is to be done with waste matter? 78. How are soiled clothes to be disposed of? 79. How often should the bedside tables be inspected? 80. Why is this necessary? 81. What characterizes a well-kept ward? 82. How can you make it attractive? 83. What care do the refuse-pails require? 84. What is your duty in regard to hospital supplies? 85. What are you expected to keep in your dressing-basket? 86. Where should it stand? 87. When should its contents be renewed? 88. What rule for keeping things in order? 89. How is confusion to be avoided? 90. What above all things must you never do? 91. How can you acquire the reputation of a neat and skillful nurse?

CHAPTER III.—1. Is bed-making an art of any great importance? 2. When does it become so? 3. When you go to a new case, what will you probably have to do first? 4. What will be the effect if you do it well? 5. What is the best material for a bedstead? Why? 6. How can you guard against vermin? 7. How exterminate them? 8. State any other method that you know to be of value. 9. What are the best dimensions for a sick-bed? 10. What objections to having it wider? Or higher? 11. Why are you forbidden to get on the bed yourself? 12. What kind of springs are most desirable? Why? 13. What over the springs? 14. What advantage has a straw mattress? Hair? 15. What do you gain by having the mattress made in sections? 16. What additional care do you then have to take? 17. What is the worst thing you can keep an invalid on? Why? 18. If you find your patient on a feather-bed, what will you do about it? 19. Is it always a matter of importance? When not? 20. In what cases is a very firm bed necessary? 21. What is a fracture-board? 22. Why do you have holes in it? 23. What is the best material for sheets? Why? 24. How should a sheet be made? 25. How do you proceed to make a bed? 26. How can you fix the under sheet firmly? 27. What precaution must be observed? 28. Should you put a blanket under this sheet? 29. How protect the bed from discharges? 30. What is a draw-sheet? 31. What can you substitute for rubber sheeting? 32. How long would you keep the rubber on the bed? 33. How much clothing should be over the patient? What kind? 34. When are woolen sheets desirable? 35. Would you allow your patient to sleep with his head under the bed-clothes? 36. Why are several light covers warmer than a single heavy one? 37. What is the very warmest thing you can put over your patient? 38. Is there any danger in using a down quilt? 39. What objection to cotton comforters? 40. What may you use in place of a counterpane? 41. What should you always have at hand at night? 42. How often do blankets need to be washed? 43. How can you remove blood-stains from them? 44. How remove stains from rubber? 45. What special attention do hospital beds require? 46. How secure uniformity in their appearance? 47. What should be the position of the bed in a sick-room? 48. How near the wall? 49. How should the light fall? 50. Should anything be allowed under the bed? 51. What precaution should be taken in touching the bed? 52. To what annoyance are patients often subjected? 53. How avoid this? 54. When the weight of the bed-clothes is painful, how may they be arranged? 55. How can you improvise a cradle? 56. How would you change the sheet under a patient? 57. Give two ways of changing the upper sheet without uncovering the patient. 58. If you can give only one clean sheet, which shall it be? 59. How often should sheets be changed? 60. What should you do to them before putting them on the bed? 61. What is always dangerous in a bed? 62. How can you let fresh air into an occupied bed? 63. Is this a safe thing to do? 64. How can you freshen the bed if you do not change the sheets? 65. What is the best possible arrangement of beds? 66. How can you transfer a helpless patient from one bed to another? Three methods. 67. How would you take hold of a patient to lift him? 68. How may you improvise a stretcher? 69. Name some cases in which a change of beds is impracticable, and tell why. 70. With an ordinary double bed, what can be done? 71. How often should pillow-cases be changed? 72. In changing the pillows under a patient's head, what is to be avoided? 73. How would you proceed to prop a patient up with pillows? 74. Describe a good pillow for this purpose. 75. Describe some bed-rests that you have seen. 76. What may you temporarily substitute for a bed-rest? 77. How can you keep a feeble patient from slipping down in bed? 78. What arrangement can be made for helping a patient to lift himself? 79. What may be done with small pillows? 80. What especially comfortable kind? 81. How do you prepare them for use? 82. Describe an air-bed. A water-bed. 83. What do you put under the water-bed? 84. What over it? 85. At what temperature should the water be? 86. How often should it be changed? 87. What special care do air- and water-beds require? 88. What can you say of crumbs in a bed? 89. How can they be kept out? 90. What does a well-cared-for bed indicate? 91. Will any serious consequences arise from its neglect? 92. What are bed-sores? 93. What causes them? 94. In what parts of the body do they occur most frequently? 95. In what cases is there the greatest liability to them? 96. Can they be prevented? 97. Can they be cured? 98. Which is easier? 99. What are the best preventive measures? 100. When should they be begun? 101. How are you to keep the bed in proper condition? 102. What can you do to harden the skin? 103. Why do you use powder? 104. What kind is advised? 105. What care is necessary in using lycopodium? 106. If the skin is abraded, how will you protect it from further injury? 107. How is the local pressure to be relieved? 108. What is the final resort as a preventive? 109. Why is a water-bed effective? 110. What are the first symptoms of a bed-sore? 111. Are the subjective symptoms always present? 112. What, then, is necessary on the part of the nurse? 113. What ought you to do when you discover signs of a bed-sore? 114. What happens if the first indications are neglected? 115. To whom does the treatment of bed-sores properly belong? 116. How much has the nurse to do with it? 117. What is the usual treatment after the skin is broken? 118. If it is left to you, what shall you do first? 119. If a slough forms, how may its separation be hastened? 120. When the slough is detached, what is discovered? 121. Is there any danger of continuing the poulticing too long? 122. What treatment does Brown-Séquard advise at this stage? 123. How will you treat the ulcer after the separation of the slough? 124. What is "Wood's Mixture"? For what is it used? 125. What other things are similarly used? 126. How is the dressing to be applied? 127. How often should it be renewed? 128. What attention should be paid to the patient's general condition? 129. What is the immediate cause of a bed-sore? 130. What danger if it is neglected? 131. Mention two ways in which a fatal result may follow.

Chapter IV.—1. Repeat the definition of health quoted. 2. Give any other comprehensive definition. 3. Of what importance is the blood? 4. Describe it as it appears to the naked eye. 5. As it appears under the microscope. 6. What are corpuscles? 7. How many kinds are there? 8. Give three points of difference between them. 9. What is the plasma? 10. Of what is it composed? 11. What gives the blood its red color? 12. What will be the appearance of the body if there is a deficiency of red corpuscles? 13. What occurs to the blood when it is removed from its natural surroundings? 14. Describe the process of coagulation. 15. Of what use is this provision of nature? 16. Does coagulation ever take place within the body? 17. What is it then called? 18. What is an embolus? 19. What is the function of the blood? 20. Who discovered the manner of its circulation? When? 21. How many kinds of blood-vessels are there? Tell the office of each. 22. Describe the heart. Locate it. 23. What is the pericardium? 24. What is its use? 25. Describe the internal construction of the heart. 26. What are the auricles? The ventricles? 27. Is there any connection between the auricles and the ventricles? 28. Is there any connection between the two sides of the heart? 29. What does the right heart contain? The left? 30. What happens if the valve between the auricles fails to close at birth? 31. Where is the tricuspid valve? The mitral valve? 32. Where are the semilunar valves? 33. What motion has the heart? 34. Are its motions voluntary or involuntary? 35. When the auricles contract, what becomes of the blood contained in them? 36. What prevents its regurgitation? 37. What occasions the sounds heard upon auscultation? 38. What interval is there between the contractions of the heart? 39. What takes place during this interval? 40. What is the state of contraction of the heart called? Its relaxation? 41. Do the two sides of the heart act together or alternately? 42. Describe the course of the blood from the left ventricle. 43. What is the largest artery in the body? 44. Describe its direction. 45. Where do the lesser arteries originate? 46. Describe the structure of the arteries. 47. What difference is there between that of the larger and the smaller arteries? 48. Which are the most elastic? 49. What effect has this elasticity upon the circulation? 50. Into what do the arteries empty? 51. Describe the capillaries. 52. Into what do they lead? 53. Describe the course of the veins. 54. The structure of the veins. 55. How do they differ from arteries? 56. In what state are the arteries found after death? The veins? 57. What is the endocardium? 58. Where is the circulation most rapid? Where is it slowest? 59. What takes place while the blood is retained in the capillaries? 60. What are the venæ cavæ? 61. Into what do they empty? 62. Review the entire systemic circulation. 63. When the blood gets back to the heart, what alteration has it undergone? 64. What must be done to render it fit for further use? 65. How is it to be purified? 66. Describe the pulmonary circulation. 67. What takes place in the pulmonary capillaries? 68. How do the pulmonary veins and arteries differ from those of the general circulation? 69. What is anastomosis? 70. What surgical value has it? 71. What is the pulse? 72. Where can the pulse-beats be counted? 73. If you fail to get them at the radial artery, what will you do? 74. Which arteries retain their pulsation longest? 75. Why is it important to watch a patient's pulse? 76. How can you best take the pulse of a child? 77. Why does the pulse-rate vary? 78. Name certain conditions that modify it in health. 79. What is the average rate in a healthy adult? In an infant? 80. Which is more common, increase or diminution in the rate? 81. What else may vary as well as the rate? 82. Describe a quick pulse. A full one. Small. Compressible. Irregular. Intermittent. 83. Can a pulse be at the same time irregular and intermittent? 84. Which is the more serious symptom? 85. Name some other forms of departure from a normal pulse. 86. What is a dicrotic pulse? 87. To what error may marked dicrotism lead? 88. Does the pulse in the two wrists ever differ? 89. What is such a pulse called? What does it usually indicate? 90. What other function has the blood? 91. How is animal heat produced? 92. What is the normal temperature of the body? 93. Is it affected by external variations of temperature? 94. How is its equilibrium maintained? 95. What effect has the action of the skin upon the temperature? 96. How does the nervous system affect it? 97. Has a normal temperature any variations? 98. When is it highest? Lowest? 99. How much variation may there be within the limits of health? Within the limits of life? 100. In what proportion is the danger to life? 101. What is hyperpyrexia? 102. What do you call high fever? 103. What is the temperature of collapse? 104. Which is more dangerous, a temperature far above, or the same number of degrees below the normal? 105. Are all diseased conditions accompanied by changes in temperature? 106. What diagnostic value have they? 107. Define pyrexia. 108. How is fever produced? 109. To what is the amount of heat produced proportional? 110. What else usually rises with the temperature? 111. Is the relation between them always the same? 112. What is indicated if the pulse is more rapid than the temperature will explain? 113. How early in the course of disease may you look for a rise of temperature? 114. Why is it important to get the earliest rise of temperature? 115. Is a slight variation of much importance? When least so? 116. If the exacerbation is found to be increasing, what do you infer? What if it begins each day earlier? 117. What may you regard as a sign of improvement? 118. Do the same daily fluctuations take place in disease? 119. When may a febrile temperature be expected to rise? Any exception to this? 120. What irregularities are sometimes observed? 121. How are these to be recognized? 122. Why is it important to take the temperature with regularity? 123. At what hours should you take it? 124. What is indicated by an irregularity in temperature in the course of a disease having usually a regular type? 125. What local causes may occasion it? 126. Distinguish between continued fever, remittent, and intermittent. 127. In what disorders does the temperature rise suddenly? 128. Name some in which the rise is gradual. 129. What is the usual course in typhoid fever? 130. What is defervescence? 131. In what two ways may it take place? 132. How may temperature be artificially reduced? 133. How elevated? 134. When will these measures be most effective? 135. How are modifications of temperature recognizable? 136. How can you measure them with certainty? 137. How do you throw down the mercury in a clinical thermometer? How far? 138. Where may the temperature be taken? 139. Will it make any difference in the result? 140. What precautions should be exercised in taking an axillary temperature? 141. Can you always get a correct axillary temperature? 142. What risk is there about taking a sublingual temperature? 143. Which is the most reliable temperature? 144. Which method would you employ in the case of an infant? 145. What points must be observed? 146. How long does it take to get a correct temperature? 147. What care does a thermometer require? 148. Why does a thermometer deteriorate with age? 149. Can you have a local without a general rise of temperature? 150. What produces it? 151. Can this local heat be measured in the same way? With the same instrument? 152. How does the surface thermometer differ from the other? 153. How do you use it? 154. Is this local temperature subject to variations? 155. After taking a temperature, what should you do next?

CHAPTER V.—1. What are the chief respiratory organs? 2. Of what are the lungs composed? 3. How are the air-cells connected with the external air? 4. What is the trachea? What other name for it? 5. What is the pleura? Its use? 6. How is the thorax separated from the abdomen? 7. Is the motion of the diaphragm voluntary or involuntary? 8. What happens to the lungs when the diaphragm descends? When it ascends? 9. What further affects the size of the thoracic cavity? 10. What constitutes respiration? 11. What is tidal air? 12. How is the stationary air purified? 13. What follows each expiration? 14. What is the normal rate of respiration? 15. How much air is taken in at each breath? 16. How many respirations does it take to completely renovate the air in the lungs? 17. What is gained by this gradual introduction of the outer air? 18. How can the capacity and strength of the lungs be improved? 19. What is the direct object of respiration? 20. Of what is the atmosphere composed? 21. What is the proportion of oxygen in it? 22. What is the use of the nitrogen? 23. What is the character of carbonic-acid gas? 24. What effects may it produce? 25. In what proportion does it become dangerous? 26. What is meant by osmosis? 27. Describe the process of purification of the blood by osmosis. 28. What relation is there between circulation and respiration? 29. How many pulse-beats are there to each respiration? 30. Name some conditions that affect the rate of the respirations. 31. How are the respirations best counted? 32. Where can the motion be felt? 33. What rate of respiration would you consider alarming? 34. Describe some variations in the character of respiration. 35. When is breathing said to be stertorous? 36. What is dyspnœa? Apnœa? 37. Name some possible causes of dyspnœa. 38. Define asphyxia. 39. What impurities does the air acquire in the lungs? 40. Which has the greater specific gravity, carbonic-acid gas or the atmospheric air? 41. Why does the heavier gas not accumulate in a stratum near the ground? 42. Why does it not in time contaminate the whole atmosphere? 43. How do the animal and vegetable kingdoms assist each other? 44. What stimulus is necessary to excite plants to the absorption of carbonic-acid gas? 45. When we are in the open air, what becomes of the products of respiration? 46. Can this process be carried on in any confined space? 47. What is then necessary? 48. Why do the wounded so often do better in tents than in hospitals? 49. What effect has impure air upon the system? 50. What other sources of impurity in the air besides the exhalations of the lungs? 51. What is the effect of combustion upon the atmosphere? 52. How many gas-lights would you have in a sick-room? 53. How much air-space is necessary for a healthy adult? 54. How much for an invalid? 55. Why is the necessity greater in sickness? 56. What is the minimum air supply? The maximum? 57. What is ventilation? 58. Distinguish between natural and artificial ventilation. 59. How many methods of artificial ventilation? Illustrate each. 60. Which is to be preferred? Why? 61. What do you mean by accidental ventilation? 62. How is natural ventilation mainly produced? 63. How does an open fire assist in ventilation? 64. Where must your fresh-air supply come from? 65. Does a strong draught prove a room to be well ventilated? 66. In what part of the room should the fresh air be admitted? Why? 67. What are necessary for good ventilation? 68. How should the inlets and outlets compare in size? 69. How should they be situated? 70. How can thorough distribution be secured? 71. Why is it more difficult to properly ventilate a small room than a large one? 72. What is the ideal condition of the air in a sick-room? 73. Is it possible to attain this? 74. How far is the nurse responsible for the condition of the air? 75. Are you like to have any difficulty in securing fresh air enough? 76. What is to be guarded against? 77. Can you always have the windows open in the sick-room? When not? 78. How will you, then, get your fresh air? 79. What can you do in ordinary cases? 80. Is ventilation equally important at night? 81. What objection is there to night air? 82. Shall we then shut it out? 83. When is the body least able to resist cold? 84. What is, then, to be done? 85. What additional ill effect if we close the windows? 86. Which will do most harm, cold air or foul air? 87. Is cold air always pure air? 88. Is ventilation as much needed in cold weather? 89. How can you test the purity of the air? 90. What does a "sick-room odor" indicate? 91. After staying for some time in a vitiated atmosphere, why are you no longer a fit judge of its condition? 92. How can you regain your sensitiveness? 93. Ought the nurse to feel personally rebuked if the doctor criticises the room as "close"? 94. Can you open the windows wide in cold weather? 95. What else should you do at the same time? 96. Mention a good way to protect the patient. 97. How long should you keep him covered? 98. If the patient can leave his room, what should you do in his absence? 99. How frequent should be the renovation of the air? 100. How can you arrange the window so as to admit air without direct draughts? 101. Of what use is a wire screen? 102. What kind of windows are the best for ventilating purposes? 103. What direction should be given to the currents of cold air? Why? 104. What is the best way of securing an outward flow of the foul air? 105. If the open fire gives insufficient heat, what should be done? 106. What if it gives too much heat? 107. What is necessary to make an extraction flue draw? 108. What must there be, to allow open windows? 109. Is it economical to heat all out-doors? 110. Do stoves aid in ventilation? 111. Are they as good as open fires? 112. What is the worst mode of heating? 113. What is essential to the wholesomeness of the air? 114. What objection is there to furnace-heat? 115. Tell some ways of imparting moisture to the air? 116. Do patients with pulmonary disease need particularly dry air? 117. What is the proper temperature for a sick-room? 118. In what cases is there especial necessity for warmth? 119. Is it as important to keep the room warm after the patient leaves his bed? 120. Do patients often take cold in bed? 121. Is there any danger of it? 122. What should prevent you from giving your patient abundant fresh air? 123. Why is it of literally vital importance? 124. Give three rules to be remembered concerning ventilation.

CHAPTER VI.—1. What point of difference should there be between a trained and an untrained nurse? 2. In what particular has the nurse an advantage over the doctor? 3. In order to form correct judgments, what is it necessary for the physician to know? 4. How is he to get such information? 5. What habits should the nurse, then, cultivate? 6. Is it an easy thing to make perfectly accurate statements? 7. What kind of a nurse will be the most valuable assistant to a doctor? 8. What are symptoms? 9. How may they be classified? 10. What are subjective symptoms? Objective? 11. Can you expect to be able to distinguish always between real and feigned symptoms? 12. When is the liability to error greatest? 13. What symptoms may be regarded with suspicion? 14. How can you become acquainted with the patient's mental attitude? 15. Should you let him feel that he is being watched? 19. Is it your place to decide as to the existence of disease? 17. Why, then, need you discriminate between real and assumed symptoms? 18. What must you know about symptoms? Illustrate. 19. What does an experienced observer note upon first seeing a new patient? 20. What more would you try to learn? 21. Why not leave the clinical history entirely to the doctor? 22. Mention some things that you should be able to report on, after having been with a patient for an hour. 23. What may his position teach you? 24. Why does a patient with a weak lung lie mostly on the affected side? 25. What attitude is suggestive of peritonitis? 26. Do you ever find a patient with peritonitis lying on the abdomen? 27. In what cases do you find that position taken? Why? 28. When you see a patient who has been long lying on the back turn to the side, what impression does it convey to you? 29. What is meant by orthopnœa? 30. What change of position indicates its relief? 31. Is lying quietly always a favorable sign? When is it otherwise? 32. In what cases is extreme restlessness ominous? 33. What do you think of a patient who keeps slipping to the foot of the bed? Is this always a serious indication? What else may it mean? 34. What expression of face is most favorable? 35. What disorders are accompanied by a pinched and anxious look? 36. What does sudden lack of expression show? 37. What appearance do you get in facial paralysis? 38. Why is it the healthy side that is distorted? 39. What is the *risus sardonicus*? 40. Name other noteworthy appearances of the features. 41. What are the most important indices of disease? 42. What are these sometimes called? 43. What must you observe about the pulse? 44. What about the respiration? 45. Does disease of the lung substance occasion much pain? 46. When may the pain be expected to be severe? 47. What is the character of the respiration in asthma? In bronchitis? In pneumonia? 48. What is dyspnœa? 49. Name and describe a peculiar form of it. 50. What does cautious respiration indicate? 51. What is œdema of the lungs? 52. How is it manifested? 53. What are râles? 54. What usually accompanies disorders of the respiratory system? 55. What commonly causes cough? 56. What do you call matter coughed up? 57. What is a dry cough? 58. Is the character of the expectoration always the same? 59. What is it like in bronchitis? In phthisis? In pneumonia? Gangrene of the lung? Cancer of the lung? 60. What often happens to the sputa in children? 61. How can you tell if this has occurred? 62. What is to be noticed about the cough? The sputa? 63. What is likely to follow a severe paroxysm of coughing? 64. Name some sounds characteristic of special diseases. 65. What is aphonia? 66. What is singultus? 67. What occasions it? 68. Is it a symptom of any importance? 69. What other ordinary phenomena become occasionally noteworthy? 70. When a patient complains of cold, what will you do? 71. If there is no apparent cause for it, what may you suspect? 72. What sensation often initiates a chill? 73. What are rigors? 74. How can you recognize a genuine chill? 75. Why does the temperature rise? 76. What may a chill indicate? 77. What probably in a surgical case? 78. When should the temperature be taken? 79. What is to be noted in regard to chills? 80. When the temperature falls, what is likely to occur? 81. What other causes may produce the same result? 82. What is the most important thing to observe in regard to the skin? 83. Which is the more alarming, a high temperature with a wet or with a dry skin? Why? 84. What other points should you note concerning perspiration? 85. What else about the skin? 86. Name some signs that will attract attention. 87. What peculiarity has the complexion in Bright's disease? With anæmia? 88. Name any other disorder that gives a characteristic color to the skin. 89. What does too high color show? A bluish color? 90. What is cyanosis? 91. What peculiarity of coloring is sometimes observed in pneumonia? 92. What usually gives warning of syncope? What appearance accompanies nausea? 94. Mention other variations from a healthy color. 95. If you discover an eruption upon your patient's skin, what should you do? 96. What should you be able to tell about it? 97. What is meant by desquamation? 98. In what cases may you expect general desquamation? 99. To what will your patient probably call attention? 100. What must be especially watched for in a case of long confinement to bed? 101. What are the early symptoms of bed-sores? 102. Can you wait for the patient to call attention to these? 103. What must you observe about wounds? 104. What ought you to promptly report? 105. Does the eye give any indications of general disorder? Name some of its significant appearances. 106. What can you say of squinting? 107. What abnormal conditions of the sense of hearing may occur? 108. When are you likely to find over-acute hearing? 109. Is this more or less significant than deafness? 110. What may occasion other disturbances of the hearing? 111. When is a discharge from the ear significant? 112. Name some unnatural conditions of the sense of taste. 113. Is it more often over or under acute? 114. Why is the condition of the tongue an especially important point to note? 115. What should you notice about it? 116. In what state would you expect to find the tongue in a case of high fever? 117. Is a coated tongue always a sign of disease? 118. What color has the fur? 119. What is the best way to have it clear up? 120. Describe the "strawberry tongue" and tell when you may look for it. The "mulberry tongue." 121. When you are looking at the tongue, what else may you observe? 122. What should you look out for when giving mercurials? 123. Does salivation ever occur under any other conditions? 124. What is ptyalism? 125. What is the probable state of the salivary secretion at the beginning of an acute disorder? 126. What will happen if the teeth are not well cared for? 127. What are sordes? 128. To what appearance of the gums should you call attention? 129. What are aphthæ? 130. Is the disease confined to infants? 131. What condition of the throat do you regard as significant? 132. What may a slight sore throat indicate? 133. What is usually the state of the appetite in acute disease? 134. Is an increased appetite common? 135. What is it called? 136. When there is a desire for food, is there always an ability to digest it? 137. Does a desire for some special article of food always show a need of it? 138. If your patient has such a longing, what will you do about it? 139. What should you be able to tell the doctor about the patient's diet? 140. Do appetite and thirst always co-exist? 141. In what sort of disease are you most likely to find extreme thirst? 142. Is nausea always relieved by vomiting? 143. What is to be observed about vomiting? 144. Of what does vomited matter most commonly consist? 145. What else may it contain? 146. What is stercoraceous vomiting? 147. What gives the appearance like coffee-grounds? 148. When there is blood in the vomited matter, where else will you look for it? 149. What appearance will it have? 150. What else may affect the color of the stools? 151. How do they look in case of jaundice? 152. What effect has bismuth upon them? Iron? 153. What else should you note about the alvine evacuations? 154. What may be present besides the normal constituents? 155. What is tenesmus? 156. What disease does it characterize? 157. What is a frequent cause of constipation? 158. Can constipation and diarrhœa exist at the same time? 159. If such is the case, what will be the character of the discharges? 160. What are scybala? 161. Does daily movement prove that the bowels are unloaded? 162. What are borborygmi? 163. What is tympanites? 164. Define dysuria. 165. What should you note in regard to the urine? 166. What function in the female calls for special attention? 167. What should you note in regard to it? 168. What may be said of any hæmorrhage? 169. What may a nose-bleed signify? 170. What ought you to note about any discharge? 171. What kind of a symptom is pain? 172. By what is it usually accompanied? 173. Is pain altogether an evil? 174. What does it imply? 175. Is its absence always a favorable indication? 176. In what dangerous condition do you get no pain? 177. How should you regard a sudden cessation of pain in a very sick patient? 178. Name two kinds of pain, and tell how to distinguish them? 179. What should you want your patient to tell about his pain? 180. What is hyperæsthesia? Anæsthesia? 181. Are they general or local conditions? 182. With what is partial anæsthesia often conjoined? 183. What is the difference between hemiplegia and paraplegia? 184. What peculiarity of temperature may be looked for with hemiplegia? 185. On which side will the temperature be highest? 186. What is aphasia? When is it most common? 187. Name some apparently slight, but really grave symptoms. 188. What is meant by subsultus? 189. What is to be noted about convulsions? 190. What are disorders of consciousness? 191. Is delirium always of the same character? 192. Name one marked type. 193. What is coma? 194. How serious a symptom is it? 195. What constitutes coma-vigil? 196. In what proportion is sleeplessness serious? 197. What should you be able to report about sleep? 198. Can the patient be trusted to tell about it? 199. What is said of symptoms in association? 200. If you doubt whether or not a matter is important, what is it best to do? 201. Is it safer to report too much or too little? 202. Name any symptoms that you consider of importance, that have not been here spoken of. 203. How ought you to keep your notes?

Chapter VII.—1. In how many ways can medicines be introduced into the system? 2. Will the results be the same by the different methods? 3. In how many ways can a remedy be introduced through the skin? 4. What is the difference between the epidermic and the enepidermic methods? 5. Describe the endermic. 6. What objection to this mode? 7. What has largely superseded it? 8. What are the advantages of hypodermic injections? 9. Is there more than one way of giving a hypodermic injection? 10. Why is the parenchymatous method preferred? 11. What danger attends subcutaneous injections? 12. What precautions need to be observed? 13. Describe the entire process. 14. What care does the instrument require? 15. For what are hypodermic injections given? 16. If an abscess follows, is it always the fault of the operator? 17. To what is it likely to be due? 18. With what drug is the liability to abscess least? 19. Which is more irritating, a dilute or a concentrated solution? 20. Where will you insert the hypodermic needle? Why? 21. Does the distance from the seat of pain make any difference? 22. What parts are to be avoided? 23. How might a fatal result be produced? 24. Is intravenous injection ever practiced? 25. How much do you need to know about it? 26. How should drugs be prepared for hypodermic use? 27. What happens if the solutions are too long kept? 28. What is meant by aqua-puncture? 29. What medicinal effects are produced by inhalation? 30. How are volatile substances given by inhalation? Non-volatile? 31. What direction should you give to a patient about using an atomizer? 32. What simple arrangement can be made for the inhalation of vapor, without special apparatus? 33. What should be the temperature of the vapor? 34. How may it be medicated? 35. What is the most common way of administering medicines? 36. Can they be absorbed through any part of the mucous membrane? 37. In what forms are medicines taken into the stomach? 38. How can the difficulty sometimes experienced in taking a pill be lessened? 39. How can you utilize old pills? 40. How are powders best given? 41. What are capsules? Wafers? 42. What is a bolus? An electuary? 43. Define a mixture. 44. What do you call a mixture of oil and water? 45. How can you make it? 46. What is the difference between an infusion and a decoction? Give examples of each. 47. What is the rule for making a decoction? An infusion? 48. Is it important to have them freshly made? 49. Is an infusion necessarily made with hot water? 50. What is meant by spirits? Tinctures? 51. How do fluid extracts differ from tinctures? 52. When is a solution saturated?

53. What bottles need to be labeled? 54. When should the label be read? Why read it twice? 55. What care should be taken in pouring? 56. How should remedies for external use be distinguished? Is not the label sufficient? 57. What medicines should you avoid giving in the dark? 58. What should you do before opening the bottle? 59. Is it always important to shake it? 60. Why are you directed not to leave the bottle uncorked? 61. Where should drugs be kept? Why in the dark? 62. Is it advisable to accumulate a quantity? 63. Is it advisable to buy cheap drugs? 64. What would you do with the surplus of a compound prescription? Why not save it on the chance of its being wanted again some time? 65. How should liniments, etc., be labeled? 66. What precaution is especially necessary in a hospital ward? 67. What care should be given to the ward medicine-chest? 68. What is the extent of the nurse's responsibility in the matter of medicines? 69. Is it ever allowable for you to assume more than this? 70. When people ask you to prescribe for their various complaints, what shall you do? 71. Are you safe in recommending what you have seen used in similar cases? 72. What things does a well-disciplined nurse never do? 73. What ought you to know about medicines? 74. Will you ever give drugs on your own responsibility? 75. Should you ever discontinue one that has been ordered? 76. Does the same dose always produce the same effect? 77. How may the susceptibility to the action of drugs be modified? 78. Of what class of drugs is this especially true? 79. What danger attends the use of narcotics? 80. What can you do to avoid it? 81. What should the patient do after taking a narcotic? 82. What effect has habit upon the dose required? 83. Is the acquired tolerance readily lost? 84. If a medicine ordered in gradually increasing doses is for a time discontinued, with what dose will you recommence its use? 85. What is meant by cumulative action? Mention some drugs supposed to act in this way. 86. How are such usually given? 87. Can you always tell what the result of a given dose will be? 88. What may affect it? 89. What do you mean by an idiosyncrasy in regard to medicine? 90. If a dose acts differently, or more powerfully than you expected, what should you do? 91. Do you keep on giving it? 92. Upon what do peculiar effects sometimes depend? 93. Is it always well to let the patient know what he is taking? 94. How should the medicine be prepared for the patient? 95. How prepare the patient for the medicine? 96. Is promptness in its administration of any great importance? 97. If you omit to give a dose at the proper time, how can you rectify

the mistake? 98. If you have no special orders, what interval would you allow between food and medicine? 99. When do drugs act most powerfully upon the stomach? 100. Name some that should not be given upon an empty stomach? Why? 101. What care must be taken about the diet? 102. If you give milk after an acid, what will be the probable result? 103. What kind of food is incompatible with iodine? 104. When should you wash the medicine-glass? 105. What medicines are likely to injure the teeth? 106. How can such injury be prevented? 107. Why do you keep a distinct glass for oils? 108. How may disagreeable flavors be overcome? 109. How would you give a dose of oil? 110. What care take in pouring it? 111. Do children require the same doses as adults? 112. What is the rule for giving medicine to a child? What exceptions to the rule? 113. Is it ever necessary to give medicine by force? When? 114. How do you proceed to do this? 115. How can you make an unconscious patient swallow? 116. How should you measure medicines? 117. Why not in a spoon? 118. Why do drops differ in size? 119. How many drops of water are equivalent to a minim? How many of chloroform? 120. How many drops are there in the minim of a tincture? Of a fluid extract? 121. Recite the table of apothecaries' weights. Of fluid measures. Of approximate measures. 122. How many grains are equal to a gramme? 123. How many minims to the cubic centimetre? How many pints to the litre? 124. What advantages has the metric system? 125. What is the unit of weight? 126. How are its multiples and divisions indicated? 127. What may be substituted for the decimal point? With what advantage? 128. With what else is it well for the nurse to be familiar? 129. Write the table of apothecaries' weight, using the symbols. 130. What is signified by C.? Gr.? Gtt.? Inf.? Mist.? O.? Pil.? Pulv.? Q.S.? Ss.? ℞? T.i.d.? ♏? 131. What are the general effects of aconite? 132. What care must be taken in the use of its external preparations? 133. What is the most powerful cardiac stimulant? In what form is it usually given? 134. What are the internal effects of antimony? External? 135. In what form is it most used? What is the dose of tartar emetic? 136. What are some of the effects of arsenic? Mention two preparations medicinally used? 137. What is the dose of Fowler's solution? 138. What is atropia? 139. Tell some of the effects of belladonna. 140. In what forms is it used externally? 141. What drug does it antagonize? 142. What effects may follow an overdose? 143. With what are the bromides incompatible? 144. With what are they often combined? 145. What are the effects of too prolonged use? 146. To what class of drugs does camphor belong? 147. Can you dilute spirits of camphor with water? What would be the result? 148. How is carbolic acid most used? 149. For what cases is castor-oil a good cathartic? 150. Is chloral given to relieve pain? 151. What effect has chloroform upon the heart? 152. What are the signs of cinchonism? 153. What symptom would lead you to discontinue the use of digitalis? 154. What is the dose of digitaline? 155. What is the effect of ergot? Dose? 156. What is Hoffmann's anodyne? 157. What is the use of gallic acid? Dose? 158. What other name for hydrochloric acid? For hydrocyanic acid? 159. What does hyoscyamus resemble? How does it differ in effect? 160. Give the symptoms of iodism. 161. What is the effect of adding water to the tincture of iodine? 162. What functions are especially stimulated by iodine? 163. What is the chief use of iodoform? 164. What is the internal dose? Effects of overdose? 165. What is the effect of ipecac in small doses? In large dose? 166. For what is iron given? 167. How and when should it be taken? 168. What forms of iron are used as styptics? 169. How does dialyzed iron differ from the other preparations? 170. What are the indications of lead-poisoning? 171. How do you make lime-water? 172. What is Epsom salt? Rochelle salt? Glauber's salt? Dose of each? 173. At what time should the saline cathartics be given? 174. If mercurial cathartics are not promptly effective, what is to be done? Why? 175. What is mercurialism? Is it likely to follow the external use of the drug? 176. What is corrosive sublimate? 177. What is the mild bichloride of mercury called? What are gray powders made of? 178. Name other forms of mercury. 179. What mineral acids are used medicinally? 180. What should be given after them? 181. What is strychnia? Its dose? Effects of overdose? 182. What effects may be expected from opium? 183. What subjects are most sensitive to opium? 184. What is the full dose of opium? 185. What is the tincture of opium called? The camphorated tincture? What is the ordinary dose of each? 186. What are the active ingredients of a Dover's powder? 187. What is morphia? 188. How much morphia does it take to equal in effect a grain of opium? 189. What is the strength of the United States solution? Of Magendie's solution? How is the latter most used? 190. Mention two other preparations of opium, and give the dose of each. 191. What is pepsin? Its use? 192. What is Vienna caustic? 193. What is saltpetre? Condy's fluid? 194. What is the dose of prussic acid? 195. How much of the strong acid does this contain? 196. What is quinia? 197. How do you give a seidlitz powder? 198. How should they be kept? What are they composed of? 199. What effects has the nitrate of silver? What common article of food is incompatible with it? 200. What is lunar caustic? 201. What is common salt? How is it used medicinally? 202. What is spirit of Mindererus? 203. What is hive syrup? Is it safe to give children without advice? Why? 204. How are stramonium-leaves sometimes used? 205. What is the dose of the tincture of stramonium? 206. In what other form have you ever seen stramonium employed? 207. What is the use and dose of tannic acid? 208. Of taraxacum? 209. How is a small dose of turpentine given? A large dose? What is it given for? 210. What ill effect may follow its use? 211. What is the dose of sulphate of zinc as an emetic? 212. What is the common name for the sulphate of iron?

CHAPTER VIII.—1. Of what elements are all animal bodies composed? 2. What do oxygen and hydrogen in combination form? 3. What proportion of water is there in the human body? 4. By what process is life maintained? 5. How is the material for combustion supplied? 6. For what other purpose is food required? 7. Of what is our food composed? 8. What are hydrocarbonaceous compounds? Name some familiar ones. 9. What is their particular use? 10. What else may they be called? 11. If more than is needed is taken into the system, what becomes of it? 12. What is the function of the nitrogenous compounds? 13. Name the most important of these. 14. What is the entire group sometimes called? 15. Has either group exclusively the one function? Show that the reverse is the case. 16. Has the classification, then, any value? 17. What is required in addition to these two great food groups? 18. How do we take these? 19. What mineral substance do we use most freely as food? 20. Which of the elements named unite most readily with oxygen? 21. What effect has nitrogen? 22. Of what value is it in the bodily tissues? 23. Which do we need more abundantly, the hydrocarbons or the albuminoids? 24. To what is the term albuminoid equivalent? 25. What is a healthy diet? 26. When does the demand for albuminoids become greater than usual? 27. Why is it important to know the constituents of our food? When is it most so? 28. What was the original meaning of the word nurse? 29. Is it still the primary office of the nurse? 30. What problems are of constant recurrence in the sick-room? 31. Whose place is it to decide what kind of food shall be given? 32. What must the nurse know about it? 33. What has she to do about it? 34. Of what quality should the invalid's food be? How should it be prepared? How served? 35. How far ought you to consult the tastes of your patient? 36. Should you each time ask him what he would like? Why not? 37. What care should be taken in cooking? 38. Should you have your own meals served in the sick-room? 39. How can you make the patient's food attractive? 40. What attention should be given to the dishes? 41. What will be the probable effect if the contents of the cup are spilled into the saucer? 42. Should food for the sick be highly seasoned? 43. What special care do milk and butter need? 44. How far from perfect must an article of food be to be discarded? 45. Ought you to taste the patient's food? When and where? 46. If it is not good, what will you do? 47. If there is any surplus, what will you do with it? 48. If you leave it near him, may not the patient take it later? 49. Is it better to bring him too much or too little? 50. If but little at a time can be taken, how will you manage to give him nourishment enough? 51. Is it possible to give him too much? 52. Is there often danger of this? 53. Does all the food swallowed do the patient good? 54. How much of it does? 55. If only a small quantity of food can be retained, of what character should it be? 56. In case of persistent nausea and diarrhœa what kind of food should be given? How often? 57. What else should you ask the doctor besides the *kind* of food that he wishes given? 58. How will you arrange to give him the desired quantity? 59. Is regularity of any importance? 60. Can a habit of digestion be acquired? 61. Should you wake a patient to feed him? 62. Is food often needed at night? 63. Where should you keep it? 64. What will sometimes help send a patient to sleep? 65. What care must you take in feeding a helpless patient? 66. Tell just how you would proceed? 67. After you have finished, what should you do? 68. What neglect frequently leads to soreness of the mouth? 69. In what cases are you likely to find excessive thirst? 70. Should all patients be allowed water? As much as they want? 71. If the quantity is limited, how can you best satisfy the craving? 72. When may ice be allowed? 73. How can you break ice in bits? 74. What are they good for? 75. How can you best keep your bits of ice? 76. Why should you not leave a spoon in among them? 77. Is ice always pure? 78. Is it important that it should be? 79. What are the characteristics of pure water? 80. Is there likely to be any difficulty in providing suitable food for the sick? 81. Is it a matter worth taking pains about? 82. What should you aim to provide? 83. What is digestion? 84. Where does it begin? 85. What peculiar property has ptyalin? 86. Where do you find it? 87. Where is the gastric secretion? 88. What is its function? 89. What part has the bile in the digestive process? 90. What other digestive fluids can you mention? 91. What is their use? 92. What becomes of the insoluble portion of our food? Of the soluble portion? 93. How may the gastric secretion be supplemented? 94. How can the intestinal digestion be assisted? 95. What is usually given with pepsin? With pancreatine? 96. What kind of food is most easily digested? 97. How far can liquid food be relied upon? 98. What is the nutritive value of meat? 99. Why may it not always be given? 100. Is a purely vegetable diet a healthy one? 101. What do the leguminous plants chiefly contain? 102. What vegetables are mainly starch? 103. Are fruits very nutritious? 104. What one article of food contains all the elements of nutrition in their proper proportions? 105. What can you say of tea and coffee? Of chocolate? 106. What elements predominate in all animal food? 107. Which kind ranks highest in nutritive value? 108. What do you think of the usefulness of beef-tea? 109. Why has it not the strength of the beef from which it is made? 110. What value has it? 111. In how many different ways can you give beef-tea? 112. How can food be artificially digested? 113. Of what else than beef can you make broth? State in the order of value. 114. How can you add to the variety? 115. How do you cook meat from which the juice is to be extracted? 116. What difference will you make in its preparation if the meat itself is to be eaten? 117. How can you remove all the fat from broth? 118. Should you be particular to do so? 119. How many kinds of gruel do you know how to make? 120. When are oat and corn meal objectionable? 121. What is recommended in such cases? 122. How can you give milk when there is nausea? If there is also constipation? 123. How can you keep milk sweet in warm weather? 124. What is koumyss? 125. How can you prepare it? 126. What value has it? 127. What proportion of solid food is it said to contain? 128. What do you think is the best way to make beef-tea? 129. Which makes the better broth, an old fowl or a young one? 130. How do you peptonize milk? 131. What nourishment would you give in case of extreme exhaustion? 132. Give some good receipt for sick-cookery not mentioned.

CHAPTER IX.—1. What forms the intestinal canal? 2. Name the subdivisions of the small intestine. Of the large intestine. 3. Is this directly continuous with the small? 4. Describe the ileo-cæcal valve. 5. What else is found near the junction of the large and small intestines? 6. What are peristaltic movements? 7. Where is the process of digestion completed? 8. What passes into the large intestine? 9. What is the peritonæum? 10. What is an enema? 11. For what purposes are enemata given? 12. Name six different kinds. 13. How do purgative enemata act? 14. Can they be expected to be effective when the accumulation is above the ileo-cæcal valve? 15. Why is a large enema more effective than a small one? 16. How much fluid would you inject at a time? 17. How do you get ready to give an enema? 18. In what position is it best to place the patient? 19. What may be necessary if the rectum is loaded? 20. In what condition is the rectum usually found? 21. How do you proceed to give the enema? 22. When does it become necessary to use force in inserting the instrument? 23. If the tube is properly inserted and yet you are unable to work the syringe, what is probably the matter? 24. Why must you never hurry with the injection? 25. If it seems to give pain, what should you do? 26. How will you prevent premature expulsion of the fluid? 27. What is to be done after the full quantity has been injected? 28. How long should the enema be retained? 29. If it is permanently retained, what becomes of it? 30. What is the best syringe to use? 31. Of what may the injection consist? 32. What have you found most effective? 33. How can an enema of soap-suds be rendered more stimulating? 34. How may scybalous masses be softened? 35. When is an injection of oil recommended? 36. What precaution should be taken in using oil? 37. What is the proper temperature for an evacuant enema? 38. When are cold enemata given? 39. What is said of the habitual use of evacuant enemata? 40. When is an emollient enema indicated? 41. At what temperature should it be? 42. What material would you use if such an order was given? 43. What is a refrigerant enema? Anthelmintic? 44. For the latter how large a quantity is needed? 45. How will it be medicated? 46. What is to be avoided in making a solution for this purpose? 47. How would you prepare an enema of starch and laudanum? 48. For what purpose will this be given? 49. What other astringents may be similarly employed? 50. How frequently should these injections be given? 51. When are sedatives usually ordered by rectum? 52. In what dose? 53. How would you give a rectal injection intended to be retained? 54. In what quantity? At what temperature? 55. What is the best instrument to use? 56. How can you insure the retention of the enema? 57. When are nutrient enemata resorted to? 58. What forms of nourishment may be given in this way? 59. Why is a variety better than one kind exclusively? 60. Can stimulants be given in this way? 61. Why is special caution necessary? 62. How can the absorption of food by rectum be facilitated? 63. What solutions are most readily assimilated? 64. How often may nutrient enemata be repeated? 65. What is the danger in giving them too frequently? 66. What is the maximum quantity to be given at one time? 67. What must be first ascertained? 68. Will it be of any use to give a nutritive enema if the rectum contains fæcal matter? 69. How can you make sure that it is empty? 70. How long do you think life could be sustained on enemata alone? 71. What care does a syringe require? 72. What can you do with a hard-rubber syringe that leaks? 73. What attention does a bed-pan need before use? After use? 74. What is a suppository? 75. For what purposes are they used? 76. Describe their form and consistency? 77. What are they made of? 78. What advantages have they? 79. What drug is most often so given? With what object? 80. What is a good laxative suppository? 81. How should a suppository be introduced? How far? 82. How can you guard against its expulsion? 83. What is the object of the vaginal douche? 84. Describe the local therapeutic action of hot water. 85. What should be the position of the patient about to take a vaginal douche? Why? 86. What is the best syringe for this purpose? Why? 87. Why should the nozzle not be perforated at the extremity? 88. In what cases is this of special importance? 89. How should the tube be introduced? 90. Why is a rubber nozzle to be preferred to a metallic one? 91. At what temperature would you have the water if it is not specified in your orders? 92. How may it be medicated? 93. How long should its injection continue? 94. In what other way can heat be applied to the vaginal walls? 95. How does a rectal douche differ from an enema?

Chapter X.—1. How may local applications be classified? 2. What do you call such as prevent putrefaction? 3. For what are counter-irritants employed? 4. How many kinds are there? 5. What are rubefacients? Vesicants? Pustulants? Give examples of each. 6. Where are counter-irritants applied? 7. What is meant by revulsive action? 8. Name some of the mildest counter-irritants. Some of the most powerful. 9. What rubefacient is in common use? 10. What is a sinapism? 11. How do you make it? 12. Would you use boiling water, vinegar, or alcohol, to mix the paste? 13. How long should a mustard plaster be left on? 14. What harm will it do if left too long? 15. When is there special need to watch it? 16. How may the action be rendered less severe? 17. If the irritation is extreme, how can it be relieved? 18. How do you make a cayenne-pepper plaster? 19. What may be substituted for it? 20. How are mustard and capsicum papers prepared for use? 21. What are "flying blisters?" 22. In what other way may a similar local stimulation be applied? 23. How is the actual cautery used? 24. How should the burn be dressed? 25. What is the most common vesicating agent? 26. Where should cantharides not be applied? 27. If the skin is very thin, as in case of a young child, how can you lessen the severity of its action? 28. Will the oil retard the action of the blister? 29. How do you prepare the part to which a blister is to be applied? 30. How will you secure it in place? 31. Why not use adhesive strips? 32. How long should it take for a blister to rise? 33. If this does not take place after a reasonable time, what is to be done? 34. What care is necessary in removing the cantharidal plaster? 35. How can you remove adherent particles? 36. After a blister is well raised, what should you do? 37. How dress it? 38. In what other ways may a blister be treated? 39. What is a perpetual blister? 40. Are they often ordered? 41. What is considered preferable? 42. What ill effects may follow the use of cantharides? 43. What corrects the action of cantharides upon the bladder? 44. What method is suggested of preparing a blister for a child? 45. How long does it take to raise a blister on a child? 46. How soon should the cantharides be removed? 47. What form is best adapted for uneven surfaces? 48. How is it applied? 49. What else is similarly used? 50. Which is the more powerful? 51. How can iodine be removed if it acts too severely? 52. If it is desirable to raise a blister very promptly, what may be used? 53. Describe the process. 54. How long should it take? 55. Why is not the quicker method always employed? 56. How are the pustulants used? 57. What is an issue? 58. How is it established? 59. How kept open? 60. In what other way can a constant discharge be maintained? 61. How do you establish a seton? 62. What daily attention does it require? 63. For what purposes are cups applied? 64. How many kinds of cupping are there? 65. Which is most used? 66. What articles are needed for dry cupping? 67. What may be substituted for the usual cups? 68. Where should the lamp be placed? 69. When everything is ready, how do you proceed? 70. What care must you take about the cups? 71. How long should each remain on? 72.

How many are usually applied? 73. Where can they not be applied? 74. Describe their mode of action. 75. What three things are to be avoided? 76. How can the cups be removed? 77. What method is suggested by Dr. Quain? 78. What advantage has it over the ordinary way? 79. What other apparatus is employed for dry cupping? 80. What is needed for wet cupping? 81. For what is it most practiced? 82. Who will do it? How? 83. Does it make any difference whether the scarificator is applied before or after the cups? 84. When blood enough is drawn, how may its further flow be checked? 85. How are the wounds dressed? 86. When are leeches used? 87. How many kinds are there? How do they differ? 88. When is the domestic leech to be preferred? 89. How much blood will a good European leech draw? 90. Where should the leeches be applied? 91. Where should you avoid applying them? 92. How can a leech be induced to bite? 93. What may hinder it? 94. How can you get the leech clean without handling it? 95. How will you apply it? 96. What precaution may you take when applying them inside the mouth or nostrils? 97. Will they do any harm if they are swallowed? 98. How can you render them harmless? 99. How long should a leech suck? 100. How do you know when they are full? 101. How can they be stimulated to more vigorous action? 102. How can you get them off? 103. Why not pull them off? 104. What kind of a scar is left by the leech-bite? 105. How may the bleeding be encouraged? How checked? 106. Is it likely to bleed to any dangerous extent? 107. How can you keep leeches that have not been used? 108. What shall you do with them after use?

CHAPTER XI.—1. For what are poultices used? 2. What else may they be called? 3. What effect have they? 4. Must they be in immediate contact with the inflamed part? 5. How large should a poultice be? 6. How hot should it be? 7. When is there greatest danger of burning the patient? 8. With what do you cover the poultice? 9. How frequently should a poultice be renewed? 10. How long may an ordinary poultice be expected to keep warm? 11. Will it do any harm to let it get cold? 12. Can poulticing be kept up too long? 13. Of what may poultices be made? 14. What is the simplest form of poultice? 15. How is spongio-piline used? 16. How do you make a linseed poultice? 17. Of what consistency should it be? 18. Why is it not as well to pour hot water into the meal? 19. Upon what should it be spread? 20. How does the finished poultice appear? 21. How can you prevent the escape of the heat? 22. What is a good way to apply a poultice for the relief of internal pain? 23. What two things should go to the patient with the poultice? 24. If it is to be applied over a wound, what should be first done? 25. How is the wound to be protected till the poultice is ready? 26. How is a poultice-jacket made? 27. How do you make a bread poultice? 28. Should you use milk if you have it? 29. Which do you consider better material for a poultice, linseed meal or bread? Why? 30. Which is the better basis for a charcoal poultice? 31. How is this prepared? 32. For what is it used? 33. Give the officinal formula. 34. In what other way can you make an antiseptic poultice? 35. For what is the yeast poultice employed? 36. How is it made? 37. Name some other stimulating poultices. Some soothing poultices. 38. For what is the starch poultice chiefly used? 39. How do you make this? 40. Describe the hop poultice. 41. What else may be similarly treated? 42. How would you make a bran jacket? How put it on? 43. What advantage has it over the linseed jacket? 44. How may the sedative effect of an ordinary poultice be increased? 45. How is a hemlock poultice made? 46. What is to be looked out for in using either opium or conium? 47. For what is the camphor poultice used? 48. How is a spice poultice made? 49. In what other way may the same effect be produced? 50. How do you make a mustard poultice? 51. How does it differ from a mustard paste? 52. Name any other materials that you have ever seen used for making poultices. 53. Is a poultice ever applied cold? 54. What are fomentations? 55. Stupes? 56. When are they to be preferred to poultices? 57. How often do they need to be changed? 58. How are the stupes prepared? 59. What is a stupe-wringer? 60. Why is it needed? 61. How much moisture should be left in the stupe? 62. What rule for applying stupes? 63. How many layers of flannel should there be? Why? 64. How is the heat to be retained in them? 65. What should be done when the fomentations are discontinued? 66. Would you apply them to discharging wounds? 67. What is their most common use? 68. How can you add to their irritant effect? To their sedative effect? 69. Is a simple hot-water fomentation irritant or sedative? 70. What may be used in the place of water? 71. If you are ordered to apply turpentine stupes, how will you proceed? 72. Is there any danger in using turpentine? 73. What precaution should be taken? 74. What is recommended as a stupe for a child? 75. In what cases would you apply it? 76. What are "dry fomentations"? 77. When are they used? 78. What may be used? 79.

How should hot bottles and bricks be treated? 80. Is there any danger of getting them too hot? 81. When is this danger greatest? 82. For what are cold applications used? 83. At what stage of inflammation are they helpful? 84. When would they be injurious? 85. In making cold applications, what two points are important? 86. What will be the effect if the treatment is begun and not kept up? 87. What is the simplest method of applying cold? 88. Why is it not always the best method? 89. How can a steady cold stream be kept up? 90. What care must you take of the bed in making wet applications? 91. What else needs to be protected? 92. What other ways are there of applying cold? 93. How is ice best applied? 94. How are ice-bags to be filled? 95. How often refilled? 96. How can you make the ice last longest? 97. Should the rubber be allowed in direct contact with the skin? 98. How is the bag to be held in place? 99. On the head, how can you keep the weight from being oppressive? 100. What may be used in place of an ice-cap? 101. How are evaporating lotions applied? 102. Name some that you have used. 103. Name some lotions otherwise used. 104. How are these applied? 105. How can you re-apply without uncovering the part? 106. What is a collyrium? 107. How do you introduce collyria? 108. Should anything in the nature of a poultice ever be applied to the eyes? 109. How do liniments differ from lotions? 110. What care is important in using them? 111. How are ointments used? 112. What is meant by inunction? 113. How is a gargle used? 114. In what other way may the throat be treated? 115. Describe the process of insufflation. 116. What should be done after an acid gargle? 117. What symptom contra-indicates the use of the nasal douche? 118. By what mode of treatment has this been superseded?

CHAPTER XII.—1. What uses has the skin? 2. Describe its construction. 3. What other names has the derma? The epidermis? 4. How do they differ? 5. What are the pores of the skin? 6. What purpose do they serve? 7. What will result if they are obstructed? 8. How is the temperature of the body regulated? 9. What other glands are there in the skin? 10. What is their function? 11. How are the pores of the skin constantly obstructed? 12. How can this be avoided? 13. Why is dirt unhealthy? 14. Show that disease can be directly traced to a lack of cleanliness. 15. Is cleanliness more or less important in sickness? Why? 16. What often leads to its neglect? 17. Is this a well-founded apprehension? 18. How would you proceed to give a sponge-bath in bed? 19. If the patient seems fatigued after the bath, what shall you do? 20. How soon after a full meal may you give a bath? Why not sooner? 21. What care should the clothing receive before it is put on? 22. How can you change a night-dress with the least exertion on the part of the patient? 23. How can you manage it if the patient must not be lifted? 24. If two garments are worn, how can they be most easily put on? 25. Where do you begin to take off the clothing from an injured patient? 26. Where, to put on a garment? 27. How can you keep a patient's teeth clean? 28. Is it important to do so? 29. How can sordes be removed from the teeth? 30. How can you comb a patient's hair most comfortably? 31. How can you keep it from getting tangled? 32. How often should a sick person be washed? 33. Are there any exceptions to this rule? 34. Are baths given for any other object than cleanliness? 35. Name some different kinds of baths. 36. Is it advisable for you to give these at your own discretion? 37. When the doctor orders a bath, what should you ask him about it? 38. If your orders are not definite, at what temperature would you prepare a "cold" bath? A "tepid" bath? A "hot" one? 39. How can you put a patient in the bath-tub without any effort of his own? 40. How will you get him out? 41. How get him dry? 42. If the bath is to be soon repeated, how can you save his strength? 43. With what objects are cold baths employed? 44. What are the general effects of cold water? 45. What will be the effect if the immersion is too long continued? 46. When will a cold bath not be ordered? 47. If the patient begin to shiver during the bath, what ought you to do? 48. Is the cold bath a suitable tonic for all cases of debility? 49. At what time of day is it best taken as a tonic? 50. By what should it be followed? 51. How long should it continue? 52. How far may a high temperature be brought down by cold baths? 53. How can the shock of sudden immersion in cold water be avoided? 54. How should the personal temperature be taken? 55. When will you remove the patient from the bath? 56. Why does the temperature continue to fall? 57. What is a fever-cot? 58. For what is it used? 59. How long is a patient usually kept on a fever-cot? 60. How is a wet pack applied? 61. What else is it sometimes called? 62. Should the feet be included? 63. How long is a pack kept up? 64. What effects may be looked for? 65. How would you treat the patient after the pack? 66. In what other ways may cold water be employed to reduce temperature? 67. After sponging a patient, should you always dry him thoroughly? 68. What will be the effect of adding alcohol to the water used for sponging? 69. After sponging with alcohol, should you rub the patient dry? 70. What is affusion? 71. For what is it employed? 72. Name different forms of it. 73. How is the douche most used? 74. Should it be hot or cold? 75. How can the shock be lessened if the part is very sensitive? 76. What are the general effects of warm water? 77. How does a hot bath differ in effect from a warm bath? 78. What will result if the bath is too hot or too long continued? 79. How can you keep the temperature the same throughout? 80. What care must you take in adding hot water? 81. Why must an invalid never be left alone in the bath? 82. What should you do if signs of faintness appear? 83. When will a hot bath not be ordered? 84. What cases are sometimes treated by continued immersion in hot water? 85. For what is a foot-bath usually given? 86. How hot should it be? 87. How may the effect be increased? 88. How can you give a foot-bath in bed? 89. How long should it be continued? 90. For what purpose will a sitz-bath be ordered? 91. How do you give it? 92. How long continue it? 93. How do you give a hot-air bath? 94. What is the object of it? 95. How may a vapor-bath be given? 96. What would you employ for either in the absence of the regular apparatus? 97. At what level should the heated air or vapor enter? Why? 98. Describe a modified Turkish bath. 99. How can vapor-baths be medicated? 100. What formula is given for an acid bath? 101. In what kind of a tub should it be given? 102. How would you prepare an alkaline bath? A sulphur-bath? 103. Why must this not be given in a metal-lined tub? 104. For what cases is it most likely to be ordered? 105. In cases of skin disease, what kind of water should be used for bathing? 106. What should you avoid doing in such cases? 107. How do you prepare a bran-bath? 108. Should you give this in a stationary tub? 109. How would you prepare a starch-bath? A salt-bath? 110. For what is the latter usually given? At what temperature? 111. How should the patient be treated after an emollient bath? 112. After a stimulating bath? 113. Give examples of each. 114. Is massage a mode of treatment of any real value? 115. How has it fallen into disrepute? 116. In what estimation is it now held? 117. Tell some effects that may be expected from it. 118. Is it always soothing to the nerves? 119. With what is it often combined in the treatment of nervous disorders? 120. In what surgical cases has it been found valuable? 121. Of what does massage consist? 122. Is it the same thing as friction? 123. How does it differ? 124. With what is it often combined? 125. What does the word as commonly used include? 126. Is massage an easily acquired art? 127. What is necessary to make a good operator? 128. Can you learn it except by actual practice? 129. Is it always practiced in exactly the same way? 130. How long does it take to manipulate the entire body? 131. What may then be looked for? 132. What character should the motions have? 133. What degree of force should be employed? 134. By what muscles should the force be applied? 135. By what part of the hand is the work chiefly done? 136. If you wish to manipulate the entire body, at what point will you begin? 137. How long would you work over the feet? 138. Describe the process as nearly as you can. 139. What should each grasp include? 140. In what direction should the muscles be stretched? 141. How should you never stretch them? 142. What is meant by the origin of a muscle? Its insertion? 143. In what direction do you stretch the muscles of the back? Of the chest? 144. How do you manipulate the abdomen? 145. What good result often follows such manipulation? 146. How deeply should friction go? 147. How many different kinds of friction are mentioned? 148. In what direction should the limbs be rubbed? Why? 149. Is friction circularly of much use? 150. How can the same results be better produced? 151. Describe the spiral movements? 152. How rapidly can friction be applied on the limbs? On the body? 153. What is malaxation? 154. How may it be combined with friction? 155. What other forms of treatment may be used together with them? 156. How much of the body should be treated at once? 157. When is percussion useful? 158. What are passive motions? Assistive motions? Resistive? 159. For what objects are they most employed? 160. What should you know about the joints before attempting to treat them? 161. What is a Roman bath? 162. Is inunction an essential part of massage? 163. When is it helpful? 164. How does the "lomi-lomi" resemble massage?

CHAPTER XIII.—1. How is the waste matter principally eliminated from the body? 2. Describe and locate the kidneys. 3. What are the ureters? The urethra? 4. What is the capacity of the distended bladder? 5. What is the length of the urethra in the female? 6. What is urea? What proportion of it is there in healthy urine? 7. What is the average quantity of urine passed in the twenty-four hours? 8. How much urea does this contain? 9. What else is in it? 10. What are its characteristics? 11. Does healthy urine always answer to this description? 12. How may it vary? 13. What circumstances affect the quantity? 14. When there is free perspiration what difference may you expect to find in the urine? 15. How much may the specific gravity vary within the limits of health? 16. What may temporarily alter the chemical reaction? 17. To what may diminished transparency be due? 18. How may the quantity be affected by disease? 19. How may the color be affected? 20. What may occasion opacity? 21. What appearance has urine which contains blood? 22. What effect has the presence of bile? 23. Name some other possible changes in the character of the urine. 24. What is likely to be its character in hysteria? In convalescence? In the early stages of fever? 25. When is a lowered specific gravity most significant? 26. In what disease do you get at the same time an abundant flow of urine and high specific gravity? 27. What occasions this? 28. What characterizes polyuria? 29. What else is it sometimes called? 30. Name some drugs that affect the quality of the urine. 31. What do you call those medicines that increase the quantity of the urine? 32. Name some diuretics. 33. What is strangury? 34. Dysuria? 35. When may dark, smoky urine be looked for? 36. What effect upon the urine has turpentine taken internally? Santonin? Rhubarb? 37. Of what importance is the observation of the urine? 38. What should the nurse always be able to tell about it? 39. What is meant by micturition? 40. What kind of a specimen is best for examination? 41. How long can it be kept? 42. How is it best kept? 43. What care must you take in getting a specimen? 44. What may be necessary in order to get it pure? 45. How should it be labeled? 46. What should you observe in regard to the sediment? 47. What apparatus will be needed for testing urine? 48. How will you determine the chemical reaction? 49. What effect have acids upon litmus paper? Alkalies? 50. When is any substance said to be neutral in reaction? 51. Does acid urine ever become alkaline after it is passed? 52. Can the alkaline ever become acid? 53. How may the volatile be distinguished from the fixed alkalies? 54. How is urine affected by standing? 55. How should your urinometer be tested? 56. What is taken as the standard of specific gravity? 57. How do you measure the specific gravity of urine? 58. In what two ways may foreign matter be present in the urine? 59. What is the most common sedimentary substance? 60. How may the urates and phosphates be distinguished from each other? 61. What other sediment may there be? 62. How is mucus recognized? 63. In what form is pus deposited? 64. What does it resemble? 65. How may they be distinguished? 66. What is the characteristic of urine in Bright's disease? 67. Is albumen found as a precipitate or in solution? 68. When albumen is abundant in the urine, what else is likely to be present? 69. How are casts to be discovered? 70. How do you test urine for albumen? 71. If the urine is not of distinctly acid reaction, how can you make it so? 72. What may occur if the acid is added in excess? 73. What is the surest way to detect a small quantity of albumen? 74. If albumen is present, how will it appear? 75. Does anything else present a similar zone? 76. How are they to be distinguished? 77. What substances are precipitated by heat? 78. What are dissolved by it? 79. Which ones are precipitated by nitric acid? Which does this dissolve? 80. What kind of urine should you think it necessary to test for sugar? 81. If the urine is albuminous, what must you first do? 82. Describe the test for sugar by means of Fehling's solution. 83. What care does the solution require? 84. How will you know if it is spoiled? 85. Give Trommer's test for sugar. 86. Any other test with which you are familiar. 87. Can the exact quantity of sugar present be determined? 88. What is suppression of urine? 89. What is retention? 90. Which occurs most frequently? 91. Which is the more serious? 92. What may cause retention? 93. How may it be recognized? 94. How may it be relieved? 95. What may occasion incontinence? 96. In what class of subjects is it most common? 97. Does a constant passage of urine prove the bladder to be empty? 98. What may be the cause of it? 99. What special care is needed in cases of incontinence? 100. When is catheterization called for? 101. Describe the process. 102. Is there any danger of inserting the instrument too far? 103. How do you know when it is in far enough? 104. What shall you do if the flow ceases before the bladder is emptied? 105. In what cases may force be used in introducing the catheter? 106. What care should you take in removing it? 107. How often should catheterization be repeated? 108. Can retention ever be relieved without it? 109. How is retention to be distinguished from suppression? 110. Why is suppression so dangerous? 111. What can be done to relieve it? 112. What is uræmia? 113. What is cystitis? 114. When the bladder is very much distended, what precaution should be taken? 115. What may result from too sudden collapse of its walls? 116. Is any exposure of the patient's person necessary in passing the catheter? 117. When should it be done by sight rather than by touch? 118. What additional care is necessary in these cases? 119. What kind of a catheter would you prefer to use? What size for ordinary cases? 120. How do you clean it after use? 121. What is the usual treatment in case of cystitis? 122. How do you proceed to wash the bladder?

CHAPTER XIV.—1. What is the duty of the nurse in regard to contagion? 2. What is contagion? 3. How are infectious diseases supposed to be propagated? 4. What is the distinction between directly and indirectly infectious disease? Mention some of each class. 5. What is meant by the period of incubation? 6. Is it always of the same duration? 7. Is disease infectious during the period of incubation? 8. When is the risk of infection greatest in measles? In scarlet fever? 9. How does the influence of typhus differ from that of the small-pox or scarlet fever poison? 10. When is a disease said to be epidemic? Endemic? 11. What are sporadic cases? 12. What are disinfectants? 13. How do they differ from antiseptics? 14. Are deodorants necessarily disinfectants? 15. Are disinfectants always deodorizers? 16. How may the latter be useful? 17. Have they any effect upon specific contagia? 18. What is the best disinfectant? 19. How does it act? 20. What else is fatal to septic germs? 21. What is the first thing to be done when a disease is pronounced infectious? 22. Why does such a case always need two nurses? 23. How can they avoid conveying the infection? 24. What kind of clothes should they wear? 25. How can the hair be protected? 26. How should the room be got ready for the patient? 27. After he is quarantined, how are you to provide against the spread of the disease? 28. Name in detail the precautions that you would take. 29. What will help to keep the air pure? 30. Is it possible to be too careful about disinfection? 31. May you not so create unnecessary alarm? 32. What mental condition predisposes to infection? 33. What may be said of insufficient precaution? 34. Why are contagious cases especially trying to the nurse? 35. What care must you take of yourself? 36. What will be the best disinfectant for yourself? 37. How can you best disinfect the air of the sick-room? 38. Will deodorizing it render it fit to breathe again? 39. In what cases is ventilation of the most vital importance? 40. When the infectious particles are thrown off by the skin, what may be done to prevent their dissemination? 41. In what diseases does this occur? 42. What is the use of burning pastilles? 43. How may charcoal and carbolic acid be used as deodorizers? 44. Are these true disinfectants? 45. What disinfectant solutions may be similarly used? 46. Why may these be regarded as genuine disinfectants any more than those previously named?

47. How far-reaching is their effect? 48. Name some gaseous disinfectants. 49. Which are the most valuable? 50. Can a room be thoroughly disinfected while it is occupied? 51. What is the most powerful of the liquid disinfectants? 52. How may it be used? 53. Is it a good disinfectant for clothing? 54. What may be used for the latter purpose? 55. What is "Condy's Fluid"? 56. What is copperas? 57. How do they affect each other? 58. What other disinfectants are incompatible with each other? 59. How far is chlorine soluble in water? 60. For what may the solution be used? 61. How is it affected by light? 62. How may sewer pipes be disinfected? 63. How may sputa-cups and other vessels be kept sweet? 64. What is a good disinfectant for this purpose? 65. How can you tell when the strength of Condy's fluid is exhausted? 66. Is isolation of the patient necessary with disease which is only indirectly transmissible? 67. Is it equally important to provide against infection? 68. In what particular is the greatest care essential? 69. How would you disinfect typhoid stools? 70. How dispose of them? 71. What else needs to be disinfected with equal care? 72. If these measures are rigidly taken, and the disease continues to spread, what is to be concluded? 73. How should the body of a person who has died from an infectious disease be treated? 74. After a contagious case is terminated, what further is necessary? 75. Is disinfection as important if the case terminates favorably? 76. Is it the business of the nurse to attend to this? 77. If you have it to do, how will you proceed? 78. How will you prepare the room for fumigation? 79. What agent will you select? 80. How can you protect polished metal? 81. Why is this necessary? 82. Describe the process of fumigation by means of sulphurous-acid gas. 83. By means of chlorine. 84. How much sulphur would you use for a room of ordinary size? 85. How can the efficiency of chlorine be increased? 86. Is this also true of sulphur?

Chapter XV.—1. What are surgical cases? 2. Define a wound. 3. An incised wound. 4. In what proportion is an incised wound dangerous? 5. When is a wound described as lacerated? 6. Which is more painful, a laceration or an incision? 7. Which will bleed more freely? Why? 8. How may a contusion be defined? 9. What is a contused wound? 10. By what is it usually made? 11. What is sloughing? 12. To what class do gun-shot wounds belong? 13. Why are they especially painful? 14. What is the character of all lacerations? 15. What is ecchymosis? 16. Do you get ecchymosis with a contused wound? 17. What is a punctured wound? 18. What makes them dangerous? 19. What may render a comparatively slight wound serious? 20. Give examples of some of the ways in which poison may be introduced. 21. What makes a burn dangerous? 22. From how extensive a burn can you expect a patient to recover? 23. How may burns be classified? 24. Describe the action of a superficial burn. 25. What is likely to follow? 26. What takes place if the burn is a little deeper? 27. Do the blisters always appear at once? 28. What is a burn of the third degree? 29. How does it heal if at all? 30. What strong tendency has the cicatrix of a burn? 31. To what does this often lead? 32. How are severe burns likely to be complicated? 33. How early may perforation of the duodenum take place? 34. What other injuries are similar in effect to burns? 35. How many degrees of injury from cold can you describe? 36. In how many different ways may a wound of the soft tissues heal? 37. What is primary union? 38. What else is it called? 39. What wounds are most likely to heal by first intention? 40. What is primary adhesion? 41. Describe the process of granulation. 42. What is secondary adhesion? 43. How does healing take place under a scab? 44. How soon does the cicatrix acquire the vitality of the older structure? 45. What classification will be ordinarily sufficient? 46. What is ulceration? 47. How can granulation be stimulated? 48. How checked, if excessive? 49. How is the healing of a granulating surface sometimes hastened? 50. Describe the process of skin grafting. What are the advantages of it? 51. What is sometimes used in the place of skin for deep ulcers? 52. What finally becomes of it? 53. What precautions are necessary in skin grafting? 54. How may the process of healing be hindered? 55. What is inflammation? 56. How is it manifested? 57. When is inflammation most painful? 58. Is it more alarming when attacking a serous or a mucous membrane? Why? 59. What is an abcess? 60. How is an abcess usually treated? 61. In opening an abcess, where should the incision be made? 62. Why should it not be left to open spontaneously? 63. What is the treatment after it is opened? 64. When is pus said to be *pointing?* 65. What is meant by *burrowing?* 66. Why are drainage-tubes used? 67. Of what are they made? 68. Describe healthy pus. 69. What is it sometimes called? 70. What accompanies the formation of pus? 71. How would you feed a patient with a large suppurating wound? 72. What is likely to be the effect of foreign matter left in a wound? 73. How else may a general inflammatory fever be occasioned? 74. What are the main points of the local hygiene of surgery? 75. Of what does the treatment of wounds consist? 76. What is the best antiseptic for surgical cases? 77. Is inflammatory fever contagious? 78. Why is one surgical case dangerous to another? 79. How can you guard against this danger? 80. Is mere proximity objectionable? 81. What proportion of suppurating wounds should be allowed in a surgical ward? 82. What should be done with the old dressings from a wound? 83. What care do surgical instruments require? 84. What care do your own hands require? 85. What danger is there to yourself if your hands are not thoroughly washed? 86. What danger to your patients? 87. How can you avoid soiling your hands? 88. What should you do if the skin is anywhere broken? 89. How do you prepare for a surgical dressing? 90. What is it important to do before beginning? 91. Do you always know what will be wanted? 92. How far can you tell? 93. What articles are needed in every case? 94. What is the advantage of the crescent shaped basins? 95. How are old dressings to be taken off? What must not be done? 96. How do you remove adhesive plaster from a wound? 97. What precaution may it be well to take? 98. How may the traces of plaster be cleaned off? 99. If you have to leave a wound undressed, how will you protect it? 100. Should it ever be left exposed to the air? 101. What care should you take in disposing of the old dressings? 102. What must be done before fresh dressings are applied? 103. How can you get the wound clean? 104. How do you dry it after washing? 105. How are very extensive wounds best dressed? Why? 106. Name some dressings that you have seen used. 107. What is the object in all of them? 108. What dressing most fully carries out this principle? 109. Describe the Lister dressing. 110. What does Lister himself say of it? 111. What is a "modified Lister"? 112. Why is the protective placed over the wound? 113. How is carbolized gauze prepared? (Note.) 114. Why is carbolic acid generally used for the atomizer? 115. How do you prepare a patient for operation? 116. Name six things that are always to be done. 117. What else has to be got ready besides the patient? 118. How do you prepare the operating-room? 119. What must you always have in it? 120. Where should the table be placed? 121. What must you find out about the dressings? 122. If a T-bandage is required, when should it be adjusted? 123. When everything is ready, what will you probably have to do? 124. How should this time be spent? 125. Why is the patient always etherized before being taken into the operating-room? 126. What is the duty of the nurse in the operating-room? 127. How many nurses are needed there? 128. What is the work of each? 129. How are new sponges made fit for use? 130. How can soiled sponges be cleaned? 131. When and why do you count the sponges? 132. In what cases is this most important? 133. What else is it well to count? 134. What instruction can never be too much emphasized? 135. Why is absolute cleanliness of so great importance? 136. Will any antiseptic take the place of it? 137. What of finger nails? 138. What anæsthetic is in most general use? 139. What others have you ever seen used? 140. How is ether given? 141. Is chloroform given in the same way? 142. What very important difference must be made? 143. What advantages has chloroform over ether? 144. Why is it not more generally used? 145. What must you never do while the patient is under chloroform? 146. What attention does the ether can require? 147. How can you prevent excoriation by the ether? 148. If you have to give the anæsthetic, what else can you do at the same time? 149. What are the signs of danger? 150. What should you do if dangerous symptoms supervene? 151. Should you ever give an anæsthetic by yourself? 152. What should be ready for the patient after the operation? 153. How should the bed be made? 154. What attention does the patient now require? 155. How can you relieve the nausea from the anæsthetic? 156. When is it necessary to support the abdomen? 157. How is this to be done? 158. In what cases is there special danger of rupture? 159. How can you prevent twitching of the stump after an amputation? 160. What special care is needed after tracheotomy? 161. What after any serious operation? 162. What food is to be given? 163. What arrangement should there be of the wound? 164. How often should it be looked at? 165. What is to be watched for? 166. When is the danger greatest? 167. From what may secondary hæmorrhage result? 168. For how long a time is there danger of it? 169. If later than the first twenty-four hours, when is it most likely to occur? Why? 170. What else is likely to follow a severe operation or injury? 171. What is meant by shock? 172. Describe the condition of a patient suffering from shock. 173. Is it dangerous? 174. What conditions are favorable to shock? 175. What treatment is to be pursued? 176. Can stimulation be carried too far? 177. What other great danger awaits a surgical case? 178. What are the most common forms of blood-poisoning? 179. What are the symptoms of erysipelas? 180. What cases are most liable to it? 181. What is the first thing to be done upon its appearance? 182. How soon may the disease be expected to terminate? 183. What is usually the initial symptom of pyæmia? 184. Give other symptoms. 185. How long does this disease usually last? 186. What is the most frequent termination of it? 187. How is it treated? 188. How is it most often occasioned? 189. How does septicæmia differ from it? 190. By what is septicæmia characterized? 191. How can you prevent the spread of erysipelas and pyæmia? 192. Give the early symptoms of tetanus. 193. With what kind of wounds does this complication most often occur? 194. What is the usual result?

CHAPTER XVI.—1. How many bones are there in the human body? 2. What uses have they? 3. Name the three most important cavities in the body. 4. How are they bounded? 5. How held in position? 6. What other office has the spinal column? 7. How many bones are there in the skull? 8. What is the cranium? 9. What are sutures? 10. Name and locate the three most important cranial sutures. 11. What is the atlas? The axis? How do these differ from the other vertebræ? 12. How many bones are there in the spinal column? 13. How are the vertebræ classified? 14. How are those of the different groups recognizable? 15. What is the thorax? 16. How many ribs have we? 17. What is the distinction between the false and the true ribs? 18. Why are the floating ribs so called? 19. Where is the ensiform cartilage? 20. Locate and describe the clavicle. 21. What other name has it? 22. What is the largest bone in the arm? 23. With what does it articulate? 24. Name the other bones of the arm. 25. Which is the larger of these? 26. What are the two prominences at the elbow called? 27. What is a bony process? 28. How is the wrist-joint formed? 29. Of what is the carpus composed? 30. The metacarpus? 31. What other bones are there in the hand? 32. How many? How arranged? 33. What forms the back of the pelvic wall? 34. Of what is this a part? 35. Of what is it composed? 36. What is the extreme end of the spinal column called? 37. How many bones make up the coccyx? 38. What bones form the remaining walls of the pelvic cavity? 39. What is the os innominatum? 40. What is the largest bone in the body? 41. Where is it located? 42. What is the acetabulum? 43. Where and what are the trochanters? 44. Name all the bones of the lower extremity. 45. What are the contents of the three great cavities mentioned? 46. Name all the bones in the head. 47. What is the composition of bone? 48. What is the chief mineral constituent?

Animal? 49. What is the periosteum? What is its use? 50. Where is the synovial fluid found? 51. With what are the bones covered at the joints? 52. How do bones increase in length? In thickness? 53. At which end of a bone is the growth more rapid? 54. Why do the bones of elderly people break more easily than those of the young? 55. Name some of the diseases to which bones are liable. 56. What occasions softening of the bone? 57. With what is periostitis usually associated? 58. What is osteitis? Caries? Necrosis? 59. Where is necrosis most common? 60. To what is it due? 61. What is synovitis? 62. What does the termination "itis" always mean? 63. What are the most common injuries of bones? 64. What is a simple fracture? 65. A compound fracture? 66. Does a flesh wound existing together with a fracture always render it compound? 67. What is the difference between a multiple and a comminuted fracture? 68. When is a fracture said to be complicated? 69. When is it impacted? 70. What is a partial fracture? 71. What other names has it? 72. In what subjects does it occur? 73. In what direction are the majority of fractures? 74. When is a fracture most serious? 75. What are the signs of fracture? 76. What is crepitus? 77. Can it always be obtained? 78. What may prevent it? 79. Give the special symptoms of some special fractures. 80. Why does paralysis follow spinal fracture? 81. What is the greatest danger from fractured ribs? 82. Is a patient with a skull fracture always insensible? 83. What are some of the most common fractures? 84. Describe Pott's fracture. 85. How is Colles's fracture produced? 86. How does Barton's fracture differ from it? 87. To what is the process of repair in a broken bone analogous? 88. Describe this process. 89. What is provisional callus? 90. Is it always formed? 91. Where most abundantly? 92. What finally becomes of it? 93. How long does it take a fracture to unite? 94. What bones unite most rapidly? 95. Can cartilage be repaired? 96. In what does the treatment of fractures consist? 97. For what are splints used? 98. What materials have you ever seen used for splints? 99. How long must a splint be? 100. How will it be prepared for use? 101. How is a gutta-percha splint made? 102. Why is it perforated? 103. What other material may be similarly used? 104. How are plaster-of-Paris bandages prepared? 105. How must they be kept? 106. How are they used? 107. In what other way can a plaster splint be applied? 108. How long should it take plaster to harden? 109. How can it be hastened? 110. How are starch bandages applied? 111. How long will they take to dry? 112.

What is a water-glass splint? 113. How can you keep a broken limb immovable until the bandages are firm? 114. How do you make sand-bags? 115. How can you keep a plaster splint clean? 116. How can you get one off? 117. For what other purpose is it sometimes necessary to cut the plaster? 118. What must then be marked before the plaster is applied? 119. What is the more usual treatment for a compound fracture? 120. Describe a fracture-box. 121. Describe any other splints that you have seen. 122. What should be done before any apparatus is applied? 123. How much extension should be made upon a fractured limb? 124. Why is any extension called for? 125. How long must it be kept up? 126. Are splints used in all cases of fracture? 127. Mention some case in which they need not be used. Some in which they can not be used. 128. Describe Buck's extension. 129. Why, with such an extension, do you elevate the foot of the bed? 130. What care should you take in lifting a broken limb? 131. What harm may be done by unskillful handling? 132. What is a dislocation? 133. When is it simple? Compound? Complicated? 134. What are the signs of dislocation? 135. How can it be distinguished from a fracture? 136. By what is a dislocation always accompanied? 137. Why is an anæsthetic usually given before reducing a dislocation? 138. How is its reduction effected? 139. What constitutes a sprain? 140. How is a sprain usually treated? 141. Is it a serious injury? 142. What is anchylosis? 143. How may it be produced?

Chapter XVII.—1. For what purposes are bandages used? 2. How many kinds are in common use? 3. What are roller bandages? 4. How are they made? 5. What are they best made of? 6. How should they be pieced? 7. How do you make a double-headed roller? 8. Can exact directions be given for putting on bandages? 9. To what must the bandage in each case be adapted? 10. What general principles are to be kept in mind? 11. If a bandage is applied too tightly, what harm will result? 12. If such proves to be the case, what is to be done? 13. How do you get a bandage off neatly? 14. How wide a bandage should you use for fingers? For the foot? The head? The thigh? 15. How is the simple spiral bandage applied? 16. How can you make it fit an uneven part? 17. How are reverses made? 18. Where should they be made? 19. What is a better form than the spiral? 20. Describe the figure-of-eight bandage. 21. How can you make it symmetrical? 22. Do you use reverses with the figure-of-eight bandage? 23. What is the rule for bandaging a limb? 24. How can you cover a foot? 25. How do you finish a bandage?

26. Describe the spica for the thigh. 27. How do you bandage a hand? 28. Why do you put cotton in the palm? 29. Where else is this necessary? 30. What other varieties of the spica can you put on? 31. Describe the double spica for the shoulder. 32. When this is finished, where should the lines of crosses appear? 33. Describe the Wilkin bandage. 34. In what cases is it useful? 35. What is the simplest way of bandaging the breasts? 36. Where do you begin in putting on the Capelline bandage? 37. Describe any other good bandage for the head. 38. How is a stump bandaged after amputation? 39. When is a many-tailed bandage to be preferred? 40. Describe the bandage of Scultetus. Describe any other variation of the many-tailed. 41. What is the chief use of the T-bandage? 42. How is a four-tailed bandage made? 43. Name some of the purposes for which this may be used. 44. In how many ways can the triangular bandage be applied? 45. Illustrate one of them. 46. Why is this a most convenient bandage? 47. When is a sling called for? 48. How would you put it on to support a dislocated wrist? A fractured humerus? A broken collar-bone? 49. How can you sling a foot? 50. For what are rubber bandages employed? 51. Are reverses required with these? 52. What special care is needed in applying them? 53. In what other way may support or protection be afforded to an injured limb? 54. What kind of plaster is to be preferred for strapping? 55. How should adhesive plaster always be cut? 56. How can you best warm it? 57. Tell how you would apply it to a leg. To the chest. To an incipient bed-sore. 58. In what cases would you apply it to the chest? 59. What advantage has it over a bandage? 60. How often should strapping be renewed? 61. How far should the strips extend? 62. Tell some cases in which you have seen strapping employed.

Chapter XVIII.—1. What is hæmorrhage? 2. How many kinds of hæmorrhage are there? 3. Give the distinguishing characteristics of each. 4. Which is the most dangerous? 5. What is traumatic hæmorrhage? 6. In what other way may hæmorrhage be caused? 7. What is meant by secondary hæmorrhage? 8. What occasions it? 9. Upon what does the amount of hæmorrhage depend? 10. Will a vessel bleed more freely if it is cut in a transverse or a longitudinal direction? Why? 11. Will you get a more severe hæmorrhage from a punctured or a severed artery? Why? 12. In what three ways does Nature tend to arrest hæmorrhage? 13. Why does fainting check hæmorrhage? 14. How may the formation of clots be encouraged?

15. What effect has elevation of the injured part? 16. In more severe cases, will these measures be effective? 17. What is the most important method of checking arterial hæmorrhage? 18. When can you be sure that hæmorrhage will not be dangerous? 19. What can you do if the bleeding vessel is too deep to be reached? 20. How do you make a compress? 21. Where only can it be applied successfully? 22. What wounds are apt to bleed freely and heal readily? 23. Why is it always easy to control bleeding from a wound of the head or face? 24. If a bleeding artery can not be reached even by a compress, what remains to be done? 25. How can you check hæmorrhage from a bleeding finger? 26. What will in every case arrest the flow of blood? 27. Why is it necessary for a nurse to know where the arteries lie? 28. Describe the course of the aorta. 29. What branches arise from the arch of the aorta? 30. Which is the largest? 31. How long is it? 32. How is it divided? 33. Where do the carotid arteries lead? 34. What do the coronary arteries supply? 35. What direction does the subclavian take? 36. Where does it change its name? 37. How is the brachial artery divided? 38. What and where is the palmar arch? 39. How can you control the circulation in the arm? 40. In the shoulder? 41. In case of hæmorrhage from the carotid artery, what would you do? 42. How high does the aorta reach? 43. Where does the abdominal aorta divide? 44. Into what? 45. How long are the common iliac arteries? 46. What direction do they take? 47. Into what do they divide? 48. What becomes of the internal iliacs? 49. What is the course of the external iliac? 50. Where does it change its name? 51. Where can the pulsations of the femoral artery be felt? 52. Where is the popliteal space? 53. Why is it so called? 54. Name and describe the chief arteries of the leg and foot. 55. What are the principal branches of the descending aorta? 56. How many intercostal arteries are there? 57. What artery supplies the diaphragm? 58. Into what does the cœliac axis divide? 59. What do the mesenteries supply? 60. Which arteries are most often compressed for the relief of hæmorrhage? 61. If sufficiently forcible pressure can not be made by the fingers, what may be done? 62. What is a tourniquet? 63. What should be done before applying a tourniquet? 64. How can you make a tourniquet? 65. Can you apply it effectively if you do not know the exact location of the artery? 66. Is it of any use to apply it in the neighborhood of the artery without striking it exactly? 67. How long may the tourniquet be left on? 68. Name two arteries to which

a tourniquet can not be applied. 69. What can you do to control hæmorrhage from the axillary artery? 70. What is Esmarch's method of preventing hæmorrhage during operation upon a limb? 71. How can flexion of a limb be made useful in controlling hæmorrhage? 72. What would you do in case of profuse hæmorrhage from the palm of the hand? 73. What is the first thing to be done with a secondary hæmorrhage? 74. What else is to be done? 75. To what other means may a nurse resort if cold, position, and pressure fail to control hæmorrhage? 76. What are styptics? 77. Name some of the most valuable. 78. How are they used? 79. What is their mode of action? 80. How would you control persistent bleeding from a leech-bite? 81. What is lunar caustic sometimes called? Why? 82. What is the actual cautery? 83. When is it employed? 84. Why should you only use styptics as a last resort? 85. What is the most common method among surgeons for the arrest of hæmorrhage? 86. Of what are ligatures made? 87. How long should they be? 88. How can you be sure that it is strong? 89. Is this important? 90. If you have it to tie, what must you be careful about? 91. What is the best kind of a knot? 92. What is the difference between a square knot and a granny? 93. Show how you make a clove hitch. 94. What is torsion? 95. Acupressure? 96. How many modes are there of arresting arterial hæmorrhage? 97. How many that the nurse may resort to? 98. Which belong exclusively to the surgeon? 99. What is the most dangerous form of venous hæmorrhage? 100. Where, in this emergency, should pressure be made? 101. Will it be of any use to make pressure above the wound? 102. What else is to be done? 103. Will the surgeon probably ligate the vein? 104. In what cases is there danger of such rupture? 105. What precaution can be taken against it? 106. How does the elastic stocking help? 107. When should it be put on? 108. Is there ever any difficulty in controlling capillary hæmorrhage? 109. What is the most valuable hæmostatic in such cases? 110. What is a hæmostatic? 111. At what temperature should the water be used? 112. What would be the effect of warm water? 113. What is meant by a hæmorrhagic diathesis? 114. With such a case, what would you probably have to do? 115. How can you stop the bleeding after a tooth has been extracted? 116. What are the constitutional symptoms of hæmorrhage? 117. How would you recognize internal hæmorrhage? 118. What is hæmoptysis? 119. What is hæmatemesis? 120. How can you distinguish them? 121. Where else might the blood come from? 122. How would you treat the patient in either case until you received orders? 123. If you cut off the return of venous blood from the limbs, what effect will it have upon the circulation in the viscera? 124. How can this be done? 125. How will this tend to arrest internal hæmorrhage? 126. What is meant by the proximal extremities of the limbs? The distal extremities? 127. After an exhausting hæmorrhage has been controlled, how can the blood remaining in the circulation be economized? 128. How do the two above procedures differ? 129. What is the object in both? 130. What symptom usually follows hæmatemesis? 131. How can you check hæmorrhage from the bowels? 132. When may this be looked for? 133. What is hæmaturia? 134. What can you do for it? 135. What should you notice about it? 136. Where does blood in the urine come from? 137. What is especially indicated in uterine hæmorrhage? 138. When is there the greatest danger of this? 139. What do you call hæmorrhage following childbirth? 140. What may you give internally in case of uterine hæmorrhage? 141. What is the object of this? 142. What local treatment may in emergency be resorted to? 143. How would you plug the vagina? 144. What is a kite-tail tampon? 145. What is epistaxis? 146. How may it be occasioned? 147. If it is a spontaneous outbreak, how may it be regarded? 148. What can you do to check it? 149. What position should be taken? 150. What can you do if the bleeding is persistent? 151. What may the surgeon do as a last resort? 152. What will you provide for him, if he concludes to plug the nares? 153. What is the mode of procedure? 154. How long are the plugs usually left in?

CHAPTER XIX.—1. Is a nurse ever called upon to take the place of a doctor? 2. When? 3. How far are you justified in doing it? 4. What should you avoid doing? 5. Is it generally safer to do too little or too much? 6. What is safe, if you do not know just what ought to be done? 7. Is it fair to expect you to know more than others? 8. What one thing should you in all cases avoid doing? 9. In case of any accident, what kind of a message should you send to the doctor? 10. What should you do while waiting for him? 11. If the case is too urgent to allow loss of time, what should you do? 12. When is immediate action imperative? Give an illustration. 13. If you wish to carry the patient any distance, how should it be done? 14. What may be used for a stretcher? 15. Is it desirable for the bearers of a stretcher to keep step? 16. What should you get ready for the patient? 17. How should the bed be prepared? 18. How can you remove the clothing with the least disturbance? 19. How many assistants are you likely to need? 20. What should you try to do with everybody else? 21. Why is a crowd objectionable? 22. What is likely to follow any severe injury? 23. What is shock? 24. What is collapse? 25. Do you ever have collapse without shock? 26. Describe a subject in a state of shock. 27. Is it likely to be fatal? 28. In the absence of a doctor, what treatment would you pursue? 29. For what may mild forms of shock be mistaken? 30. What is syncope? 31. How does it differ from shock? 32. What should you do for a person who has fainted? 33. Is there any danger in the inhalation of hartshorn? 34. What are some of the most common casualties? 35. Is it important for a fracture to be set immediately? 36. What will do more harm than to leave it for a time without reduction? 37. What may you do? 38. How would you treat a broken leg while waiting for the doctor? An arm? 39. In what position would you place a patient with a fractured clavicle? Patella? 40. If you suspect broken ribs, what should you look out for? 41. If skull fracture, what would you do? 42. What for a broken jaw? 43. Why is it more important for a dislocation to be promptly reduced? 44. Would you ever try to reduce a dislocation yourself? 45. In what cases? 46. How can a dislocated jaw be replaced? 47. What would you do for a finger out of joint? 48. Which one is the most difficult to reduce? 49. Is there danger in applying too much force? 50. What danger is there in meddling with larger joints? 51. What further attention is needed after a dislocation has once been reduced? 52. When do sprains most frequently occur? 53. How can the pain be relieved? 54. What is the most essential part of the treatment? 55. How should the joint be supported when it is first used? 56. How would you treat bruises? 57. What might be useful after a general contusion? 58. Do contusions ever occasion shock? 59. What would you do for a crushed finger? 60. In what particular does a lacerated and contused wound need special care? 61. Name five things that must be attended to with all wounds. 62. With what wounds is rest especially important? 63. When the chest is injured, on which side should the patient lie? Why? 64. Is the danger from a wound always in proportion to the amount of hæmorrhage? 65. What wounds are likely to bleed freely without being dangerous? 66. How do you wash a wound? 67. How thoroughly do you wash it? 68. After it is clean, what is to be done next? 69. How would you dress a scalp-wound? 70. If a wound can not be held together by adhesive strips, what will be needed? 71. How would you treat a cut finger? 72. Suppose it were cut entirely off. 73. Where may collodion be used with good effect? 74. How many coats should be applied? 75. Where can it not be used? 76. What is collodion? 77. What is the most important point with a punctured wound? 78. How can you insure its healing from the bottom? 79. How is a splinter to be removed? 80. Suppose it to be under the nail. 81. How would you get out a fish-hook? 82. What very serious complication may follow a slight injury? 83. What are the early symptoms of tetanus? 84. When do they come on? 85. What wounds are most likely to result in tetanus? 86. What is the common name for it? 87. What is to be done? 88. How would you treat a snake-bite? 89. Is the bite of any animal dangerous? 90. Should you endeavor to check the bleeding at once? 91. How would you treat the sting of a wasp or bee? 92. How can you allay the irritation of mosquito-bites? 93. Of the eruption from poisonous ivy or sumach? 94. What accidents usually create the greatest panic? 95. If your own clothes catch fire, what should you do? 96. What can you do for any one else in the same condition? 97. Why lie down? 98. What is always the greatest danger? 99. What is the first object in the treatment of burns? 100. What would you do for a burn of the first degree? 101. Of the second or third? 102. What is carron-oil? 103. What is likely to follow severe burns? 104. Can anything be done to prevent deformity from the contracting cicatrix? 105. What is to be done in case of burning by strong acids? 106. By the alkalies? 107. What would you do for a fragment of lime in the eye? 108. How strong would you make your acid antidote? 109. How would you try to remove any other foreign matter from the eye? 110. In what direction should the eye be rubbed? 111. What can you do if the pain persists after the cause has been removed? 112. If a particle is imbedded in the eyeball, what can you do? 113. How may you get an insect out of the ear? 114. How any hard substance? 115. When should you not inject water into the ear? 116. What can you do in such a case? 117. Is it of importance to have the obstruction removed? 118. How can you get a foreign body out of the nose? 119. The throat? 120. In the latter case, is it well to push it down? 121. If an indigestible object has been fairly swallowed, need you have any further anxiety about it? 122. Would you give a cathartic in such a case? 123. What should be the character of the food taken? 124. How may a foreign body in the trachea be expelled? 125. What may result if it is not dislodged? 126. What is asphyxia? 127. Name some cases in which death results from asphyxia. 128. What is artificial respiration? 129. When is it resorted to? 130. What method is most practiced? 131. Describe it. 132. How often should the motions be repeated? 133. How long should they be continued? 134. Describe Marshall Hall's method. 135. For how long may there be total cessation of breath without fatal result? 136. How would you treat a person apparently drowned? 137. How soon would you consider the case hopeless? 138. If you found a body hanging, what would you do? 139. How would you treat a case of suffocation from any cause? 140. What symptoms usually precede sunstroke? 141. Does it only follow direct exposure to the sun's rays? 142. What will aggravate the tendency to heat prostration? 143. Describe the usual condition of a patient suffering from such an attack. 144. How would you treat him if you had no advice? 145. Can you afford to wait long for a doctor? 146. What is the first object in view? 147. Would you give stimulants? 148. How does a stroke of lightning cause death? 149. Is it always fatal? 150. What treatment is to be employed? 151. With what is it likely to be complicated? 152. How would you treat any one suffering from the effects of extreme cold? 153. How a frost-bitten extremity? 154. To what are convulsions in the adult commonly due? 155. How may an epileptic attack be distinguished from syncope? 156. How is it often initiated? 157. Describe the patient's condition. 158. What is the proper treatment? 159. Is there immediate danger? 160. Do you think you could distinguish a hysterical from a genuine epileptic fit? 161. Is it important that you should? 162. What points will it be desirable to notice? 163. To what other causes might convulsions be due? 164. What kind of convulsions call for energetic treatment? 165. What is the treatment of uræmic poisoning? 166. Are there often convulsions with apoplexy? 167. What are the symptoms of apoplexy? 168. With what may it be confounded? 169. Name some points of difference. 170. What would you do in the one case that you would not in the other? 171. At what age are apoplectic attacks most common? 172. What would lead you to expect a fatal issue? 173. Should the odor of alcohol in the breath lead you to infer intoxication? 174. If you found a person insensible, what should you do first? 175. What ought you particularly to observe? 176. What other cause of insensibility might there be besides those above named? 177. What would you do in all cases? 178. How may poisons be classified? 179. What is an irritant poison?

180. How does it produce death? 181. What is a narcotic poison? 182. An acro-narcotic? 183. In the treatment of poisoning what three things are aimed at? 184. How would you proceed to remove the injurious substance? 185. What does Dr. Esmarch suggest as a substitute for the stomach-pump? 186. What is usually preferable? 187. What emetics can you find in every house? 188. How would you give salt or mustard as an emetic? 189. Name some others, and tell the quantity to be used. 190. Can you give too large an emetic? 191. What will be the effect if the emetic is too much diluted? 192. Is it important to have it thoroughly dissolved? 193. What may it also be desirable to give? 194. What should you give after any irritant poison? 195. Name some readily obtained demulcents. 196. Is it always safe to give oil? 197. What will antagonize the acids? The alkalies? 198. What would you give after sulphuric acid? Oxalic? 199. In what two ways may the antidote to a poison act? 200. How would you treat poisoning by carbolic acid? Prussic acid? 201. What are the symptoms of poisoning by the metallic irritants? 202. Name some of them. 203. What is the antidote for arsenic? 204. How is it prepared? 205. What for corrosive sublimate? Nitrate of silver? 206. How would you treat poisoning by cantharides? 207. What are the symptoms of narcotic poisoning? Of poisoning by an acro-narcotic? 208. Name some of the most common of each. 209. What should be the treatment? 210. How would you recognize a case of opium poisoning? 211. What could you do to quiet the convulsions from strychnia? 212. What do they resemble? 213. What would you do in a case of insensibility from chloroform? 214. How would you treat a case of poisoning by some unknown substance?

CHAPTER XX.—1. In what cases is the nurse most often called upon to take the place of the physician? 2. What should a nurse who undertakes the charge of an obstetric case know how to do? 3. Will the instructions given here be sufficient for her? 4. What more ought she to know? 5. What is the development of an embryo in the uterus called? 6. What changes take place in the uterus during pregnancy? 7. Tell some other indications of pregnancy. 8. What constitutional disturbances are likely to occur? 9. Are any of these symptoms positive evidence of pregnancy? 10. What is meant by a spurious pregnancy? 11. What are the only reliable tests of pregnancy? 12. What is meant by ballottement? 13. How early can the pulsations of the fœtal heart be detected? 14. How can they be distinguished from the maternal pulse? 15. At what date do the movements of the fœtus generally begin to be felt? 16. What is the amnion? 17. What besides the fœtus does it contain? 18. How is the fœtus nourished? 19. How is it connected with the uterine wall? 20. What is the funis? 21. How long does it take for the embryo to become fully developed? 22. What is parturition? 23. What are the distinctions between abortion, miscarriage, and premature labor? 24. What indications are there of an approaching abortion? 25. Is there any hope of averting it after hæmorrhage has once begun? 26. What should be done? 27. If the miscarriage takes place, what after-care is needed? 28. Is it physically a matter of any grave importance? 29. What subjects are most liable to miscarriage? 30. What should be the full duration of pregnancy? 31. What are the preliminary symptoms of parturition? 32. How may true labor pains be recognized? 33. How may false pains be relieved? 34. How many stages of labor are there? 35. What takes place during the first stage? 36. What terminates it? 37. When is the second stage ended? 38. Of what does the third stage consist? 39. What is the puerperal state? 40. In what condition should the uterus then be? 41. How long do the after-pains continue? 42. How long may the lochial discharge be expected to continue? 43. How long does it take for the organs to be restored to a normal condition? 44. What is this process called? 45. What danger attends the puerperal state? 46. What cases should you refuse to take when you are expecting to go to a case of confinement? Why? 47. What is the average duration of labor? 48. Is it often much less than this? 49. In what cases is it most likely to be shorter? 50. How are you to determine whether or not labor is actually in progress? 51. If you conclude that it is, what have you to do? 52. Should the patient be at once put to bed? 53. How should the bed be prepared? 54. How should the patient be prepared? 55. What articles should you have at hand? 56. Would you allow the patient food at this time? Stimulants? 57. How long may the first stage of labor be expected to last? 58. What should you do during this stage? 59. Are repeated examinations called for? 60. Is it important to make out the presentation of the child clearly? 61. How and when do you make your examination? 62. Is a chill at this stage an alarming symptom? 63. When should the patient be put to bed? 64. What position should she take? 65. Can you always make out the presentation before the membranes are ruptured? 66. How soon must it be done? 67. What part presents in a natural labor? 68. How may the head be recognized? 69. What are the fontanelles? 70. How are they distinguished from each other? 71. What would you do in case of prolapse of the cord? 72. How can you recognize this condition? 73. What is its danger? 74. May any other part become prolapsed with a head presentation? 75. What will be the patient's condition during the second stage of labor? 76. What should you now do? 77. What assistance can be given? 78. Should the bearing-down efforts be encouraged? 79. For how long? 80. How can you lessen the danger of perinæal rupture? 81. What cases are most liable to this complication? 82. What are you to do if you find the cord about the child's neck? If it is too tight to be unwound? 83. How long must you support the perinæum? 84. What is the first thing to do to the child? 85. If the child does not begin to breathe, what must you do? 86. How soon will you separate it from the mother? 87. How will you do this? 88. Why do you tie the cord twice? 89. How can you resuscitate an infant apparently still-born? 90. What must be done to the mother immediately upon the birth of the child? 91. How long should the uterus be held? 92. How soon does the expulsion of the placenta follow? 93. Should you do anything to hasten it? 94. How can you tell when the uterus is empty? 95. What shall you do if it fails to contract after the birth of the child? 96. What should you do to the placenta as it slips out? 97. For what must it be examined? 98. How is it to be disposed of? 99. What is finally to be done for the mother? 100. How do you make a binder? 101. How can you make additional pressure over the fundus uteri? 102. What is next to be done for the child? 103. What is the vernix caseosa? 104. How can it be removed? 105. What is the proper temperature for the child's bath? 106. Tell just how you would proceed to give the bath? 107. How is the cord to be dressed? 108. How long will this dressing have to be continued? 109. What should you particularly observe upon first washing the baby? 110. If there is milk in the child's breasts, how should you treat them? 111. Ought they to be squeezed? 112. How soon would you put the child to the mother's breast? 113. What is the colostrum? 114. What effect is it supposed to have? 115. What is the meconium? 116. How does the suckling of the child affect the uterus? 117. How does it affect the breasts? 118. Is it important for the baby to be fed at once? 119. When does the milk appear in the breasts? 120. What happens if they are not relieved of it? 121. When is the use of a breast-pump called for? 122. What may be substituted for it? 123. How can you draw out a retracted nipple? 124. What care do the breasts require? 125. What caution must be observed in putting the child to the breast? 126. If the nipples are tender, how should they be treated? 127. If the child is not to nurse its mother, how can the secretion of milk be checked? 128. In the absence of the mother's milk, what is the best food for the child? 129. What two things is it important for the child to do within the first twenty-four hours? 130. If these do not occur naturally, what can be done? 131. How often should the child's napkins be changed? 132. How often may the bowels be expected to move? 133. How long is the process of digestion in an infant? 134. How often should it be fed? 135. What should be done after each nursing? 136. Should you let the child suck all the time in order to keep it quiet? 137. What will be the result if you do? 138. Is a baby always hungry when it cries? 139. Does it cry without any reason? 140. How much should you expect an infant to sleep? 141. Where should it sleep? 142. In what position? 143. What attention does the mother require during the puerperal state? 144. What is the most important point? 145. How long should she be kept in bed? 146. What kind of diet should she have? 147. How soon should the bowels be moved? The bladder emptied? 148. What is post-partum hæmorrhage? 149. What is secondary hæmorrhage? 150. Is it likely to follow a natural labor? 151. Can dangerous hæmorrhage take place before the child is born? 152. What is the first indication of post-partum hæmorrhage? 153. What other symptoms must be watched for? 154. How high a pulse may be regarded as dangerous at this time? 155. What would you do if you were alone with a case of post-partum hæmorrhage? 156. To what other dangers is the puerperal state liable? 157. What causes puerperal fever? 158. How long should antiseptic precautions be kept up? 159. What are the symptoms of puerperal fever? 160. At what time do they usually come on? 161. With what is it frequently complicated? 162. What does it most resemble? 163. How is it treated? 164. What is phlegmasia dolens? 165. Is it a disease exclusively of the puerperal state? 166. From what does it most commonly result? 167. What are the symptoms? 168. The treatment? 169. Of what character are puerperal convulsions? 170. What is puerperal mania? 171. Is the patient likely to recover from it?

Chapter XXI.—1. What qualities are especially requisite in the care of sick children? 2. Why is a habit of observation here more than ever essential? 3. Do children respond readily to treatment?

4. What may be learned from the character of a baby's cry? Illustrate. 5. Mention some symptoms especially noteworthy in children. 6. How should an infant's temperature be taken? 7. When should the pulse be taken? 8. Which is the more alarming in a child, a very slow pulse or a very rapid one? 9. Is a child's general condition much affected by a few days' illness? 10. If a child has evident pain and fever, what should you look for? 11. Why are young children good patients? 12. Why are they often difficult ones to nurse? 13. What is the first thing to be done when you undertake the charge of a child? 14. What must always be avoided? 15. Are children liable to the same diseases as adults? To any others? 16. What is it well to do when a child first seems to be ailing? 17. What will be the effect of this? 18. How can you give a bath without any shock to the nerves? 19. At what temperature should it be? 20. How long should the child remain in it? 21. What is the proper food for a baby? 22. If the mother's milk can not be had? 23. What does Jacobi recommend? 24. At what temperature should the baby's food be given? 25. What care does the nursing-bottle require? 26. If the food is rejected, what is to be inferred? 27. Does it indicate anything seriously wrong if the milk regurgitated is sour? 28. What simple thing will often quiet a restless child? 29. How often should a young infant be fed? 30. How often when it is a year old? 31. When may you begin to vary the food? 32. When may it have solid food? 33. Which is the more nutritious, thick food or thin? 34. When may the teeth be expected to appear? 35. What usually accompanies dentition? 36. What care does the child require at this time? 37. What is to be done if the gums are painful? 38. What is meant by thrush? 39. What often occasions it? 40. How is it commonly treated? 41. How long does it usually last? 42. Is it ever dangerous? 43. What simultaneous appearance indicates danger? 44. What attention must be paid to a baby's eyes? 45. When is purulent ophthalmia likely to occur? 46. Of what degree of importance is this? 47. How is it to be treated? 48. Is the danger of contagion confined to children? 49. How can you guard against it? 50. What are the most common troubles of children? 51. How would you treat a baby with colic? 52. To what is this ordinarily due? 53. What should you do if the child has diarrhœa? 54. How can you keep it from becoming chafed? 55. Is there any danger from diarrhœa? 56. Would you give paregoric in such cases? If so, how much? 57. How may a tendency to constipation be overcome? 58. How often should an in-

fant's bowels move? 59. How can you secure a movement if it does not occur naturally? 60. How can habits of regularity be established? 61. What is the danger of overstraining? 62. If protrusion of the bowel occurs, what ought you to do? 63. How will you know if a child is troubled with worms? 64. What kind are the most common? 65. How is such a case to be treated? 66, What would you do for incontinence of urine in a child? 67. What may occasion cholera infantum? 68. At what season of the year is it most likely to occur? 69. What are the early symptoms? 70. What care is necessary? 71. Is it often fatal? 72. To what may convulsions in a child be due? 73. When are they alarming? 74. What is the first thing to be done? 75. What can you safely do while you are waiting for the doctor? 76. What if the temperature runs high? 77. What is croup? 78. How does it come on? 79. What two kinds are there? 80. What is the difference between them? 81. What is the treatment of either until the doctor comes? 82. Which yields most readily to treatment? 83. Are the attacks likely to recur? 84. What characterizes membranous croup? 85. What does it closely resemble? 86. Describe the later stages of the disease? 87. What is the last resort? 88. How does whooping-cough begin? 89. How long does it last? 90. What is the chief danger attending it? 91. What care is necessary? 92. How should you care for a child with any disease of the lungs or air-passages? 93. What is mumps? 94. Describe the affection and the usual treatment. 95. What can you say of chicken-pox? 96. What is the technical name for measles? 97. Is the disease confined to children? 98. What is the average period of incubation? 99. When does the eruption appear? 100. Describe it. 101. How long does it last? 102. Name other symptoms. 103. What may complicate the disease? 104. What do you mean by sequelæ? 105. How long does a child with measles require care? 106. Tell some special points in which care is important. 107. Is a recurrence of the disease common? 108. What is roseola? 109. What very dangerous disease is most common in young children? 110. Give some of the symptoms? 111. What is the most essential part of the treatment.

Chapter XXII.—1. What makes diagnosis difficult? 2. Is it ever expected of you? 3. What will you find it an advantage to know? Why? 4. Is it to be expected that any individual case will correspond exactly to the given type? 5. What is bronchitis? 6. What is the most dangerous form of it? 7. How does the acute disease begin? 8. What is its probable course? 9. How is it usually treated? 10.

What is pneumonia? 11. Which side is most often affected? 12. Is the initiation abrupt or gradual? 13. What is the character of the expectoration? 14. When does the disease reach its height? 15. What is meant by resolution? 16. In what other ways may the disorder terminate? 17. What is the greatest danger? 18. How can you economize the patient's strength? 19. What should be the character of his diet? 20. If an oil-silk jacket is ordered, how will you make it? 21. What is the safest way to remove it? 22. How is pneumonia often complicated? 23. What is pleuritis? Empyema? Pleurodynia? Phthisis? 24. What is asthma? 25. Is it dangerous? 26. How can the dyspnœa be relieved? 27. What is laryngismus stridulus? 28. How does it differ from true croup? 29. What often occasions diphtheria? 30. By what is it characterized? 31. What are the early symptoms? 32. Is it contagious? 33. What precautions must be taken? 34. How is the patient to be nourished? 35. What often leads to a fatal termination after convalescence seems to be established? 36. How long would you keep the patient in bed? 37. What is peritonitis? 38. From what does it result? 39. By what is it characterized? 40. How does the pain differ from that of colic? 41. What attitude does the patient usually take? 42. Should any effort be made to empty the bowels? 43. How should the patient be fed? 44. What are the indications of strangulated hernia? 45. What measures are called for? 46. What is the main characteristic of Bright's disease? 47. From what does acute Bright's disease commonly result? 48. Describe the general condition of the patient. 49. What is the danger? 50. What symptom would you regard as most alarming? 51. What is the direct object of treatment? 52. How would you feed a patient suffering from this disease? 53. What characterizes diabetes mellitus? 54. Is there any glucose found in the urine in health? 55. In what subjects is the disease most common? 56. What are the symptoms? 57. Do they come on suddenly? 58. When is the disease most serious? 59. What care does the patient need? 60. What is to be prohibited besides sugar? 61. What is dysentery? 62. What is its most characteristic symptom? 63. What is meant by tenesmus? 64. What is the character of the evacuations? 65. Do they need to be disinfected? 66. In what condition must the patient be kept? 67. On what should he be fed? 68. To what may the inflammation lead? 69. How does cholera morbus differ from genuine cholera? 70. By what is it usually caused? 71. Is it often fatal? 72. Is it important to check the diarrhœa at once? 73. Is medication usually necessary? 74. What treatment is important? 75. What are the symptoms of Asiatic cholera? 76. When is it to be feared? 77. How is it communicable? 78. What is the usual treatment? 79. In all cases of diarrhœa what should be insisted upon? 80. How would you nourish the patient? 81. Would you allow him to drink all he wanted? 82. How can you guard against the spread of the disease? 83. Should you think it necessary to isolate the patient? 84. What is typhoid fever? 85. What other name has it? 86. When is it most common? 87. If it occurs as an epidemic, what is to be looked for? 88. What is the period of incubation? 89. The usual duration of the disease? 90. Is the disease usually recognized promptly? 91. How does it generally come on? 92. What is the character of the fever during the first week? 93. How high may it be expected to rise? 94. When does the eruption appear? 95. Describe it. 96. What other symptoms accompany it? 97. What is the character of the evacuations? 98. In what condition would you expect to find the tongue? 99. Describe the characteristic typhoid state. 100. How is the fever during the second week? 101. When does it again become remittent? 102. When is the period of greatest danger? 103. When should you begin to look for improvement? 104. How does the improvement manifest itself? 105. When may you regard convalescence as established? 106. Will it be rapid? 107. What is a relapse? 108. Are relapses common in this disease? 109. How may convalescence be complicated? 110. Do you regard your patient as out of all danger when the fever has left him? 111. What is the greatest danger in typhoid fever? 112. What are the symptoms of perforation? 113. Can you have intestinal hæmorrhage without perforation? 114. By what is it usually preceded? 115. Is there always a discharge of blood from the bowels? 116. What is the treatment? 117. How long does a typhoid case need careful nursing? 118. How long should the patient be kept in bed? 119. What must be his diet? 120. What may result from indiscretion or over-exertion? 121. Upon what does recovery mainly depend? 122. To what danger do the extreme weakness and emaciation lead? 123. What attention should be given to the mouth and teeth? 124. How can you keep the latter free from sordes? 125. Should you allow the patient to drink all he wants? 126. Suppose he is delirious or too feeble to tell what he wants. 127. What should be the temperature of the room with high fever? 128. How would you dispose of the stools in a case of typhoid fever? 129. How disinfect them? 130. Is this of much importance? 131. How does typhus fever resemble typhoid? 132. Where is the disease usually found? 133. How does it commonly begin? 134. When does the rash appear? 135. What does it look like? 136. How long does it persist? 137. What is the mental condition? 138. What is the duration of the disease if it terminates favorably? 139. Are relapses common? 140. Name six important points in the case of a patient with typhus fever? 141. What is the best remedy? 142. Why must strict quarantine be preserved? 143. What is the period of incubation of scarlet fever? 144. How is it likely to begin? 145. When and where would you look for the eruption? 146. Describe it. 147. Is the eruption always present? 148. Is its absence a favorable symptom? 149. How long does it last? 150. What follows it? 151. When is the most infectious period? 152. How long must the patient be isolated? 153. Is this as important with a light case as a severe one? 154. What other symptoms of scarlet fever? 155. What complications are to be feared? 156. What symptoms would lead you to anticipate troublesome sequelæ? 157. When is the greatest care necessary? 158. What is the usual treatment? 159. What is scarlatina? 160. What is variola? 161. What is the period of incubation of the latter disease? 162. What are the first symptoms? 163. What decides the nature of the case? 164. Describe the rash of small-pox, its time and mode of appearance. 165. What else happens when the rash appears? 166. When does the fever return? 167. What often precedes it? 168. What is the common course of the rash? 169. What is meant by confluent? Discrete? 170. Which form of small-pox is most dangerous? 171. At what time is it most dangerous? 172. What relation has the danger to the eruption? 173. When may the secondary fever be expected to subside? 174. What would another high rise of temperature suggest? 175. How is a case of small-pox to be treated? 176. How can you relieve the pain attending the eruption? 177. What should be done to the vesicles when they become prominent? 178. What should you do in case of delirium? 179. Is this likely to occur? 180. Why should you keep the room dark? 181. What three things must you try to do? 182. How long must you isolate the patient? 183. How completely must you do it? 184. At what stages is the disease infectious? 185. What protects against it? 186. What is varioloid? How does it resemble variola vera? 187. From what does acute rheumatic fever usually result? 188. What else may it be called? 189. What is the first symptom? 190. By what is it followed? 191. Will you expect free action of the skin? 192. Of the kidneys? 193. What is likely to be the character of the urine? Of the perspiration? 194. What is the greatest danger? 195. Why are stimulants usually avoided? 196. What care does the patient especially need? 197. Is there likely to be delirium? 198. When giving stimulants in fevers, what points are to be especially noted? 199. What would lead you to suspend their use and ask further advice? 200. When is there special need of caution in giving stimulants? 201. If stimulants are doing good, what effects will follow their administration? 202. What is said of restraint in delirium? 203. How can it be made effectual? 204. When is it necessary? 205. Should it ever be resorted to unless absolutely necessary? 206. What is said of the care of insane patients? 207. From what does delirium tremens result? 208. What are its characteristic features? 209. What are the important points in the nursing? 210. What difficulty may be anticipated? 211. How may the case end?

CHAPTER XXIII.—1. In how many different ways may disease terminate? 2. What is metastasis? 3. How may the character of convalescence vary? 4. In what class of disease is abrupt convalescence most common? 5. How is it usually established in acute disorders? 6. What is meant by resolution? 7. Do convalescents require much care? 8. In what particulars is even increased watchfulness called for? 9. When a convalescent patient first gets up, what style of dress is most suitable? 10. Should the room be as warm as when the patient is in bed? 11. Why is it less fatiguing to walk than to stand? 12. How can you protect the patient from draughts? 13. If she only sits up in bed, is there the same need for protection? 14. Why is a jacket to be preferred to a shawl? 15. How do you make the "Nightingale" wrap? 16. Should a patient be allowed to receive visitors when he first sits up? 17. How much authority should you have on the question of visitors? 18. How should you exert it? 19. Which is preferable for an invalid, a succession of visitors, or several at a time? 20. How can you keep people from shaking the bed? 21. What other objectionable thing are visitors apt to do? 22. When should visitors not be admitted? 23. What should you try to do toward night? 24. Is it desirable to hush every sound as soon as the patient falls asleep? 25. If you have occasion to wake him, how should you do it? 26. Will you often have occasion to do this? 27. In what cases may it be necessary? 28. What should you have at hand for the night? 29. What should be your own costume for the night? 30. How should you arrange the light? 31. Would you send for a clergyman to visit your patient? When? 32. Is death always a painful struggle? 33. In what different ways may death approach? 34. What are the three vital organs? 35. What are some of the signs of approaching death? 36. Should you inform his friends when you think a patient is about to die? 37. How long must you continue to try to save life? 38. How will you know when death has occurred? 39. Is there any danger of announcing it prematurely? 40. Is it probable that you will often be in doubt whether or not death has taken place? 41. What conditions are likely to be confounded with it? 42. What may be the temperature of the body after death? 43. Why does it often rise? 44. How long may the elevation of temperature be expected to endure? 45. What then occurs? 46. What is the rigor mortis? 47. How long does this last? 48. What must be done before it comes on? 49. How do you prepare a body for burial? 50. What is the effect of keeping a body on ice? 51. How can slight discolorations be hidden? 52. What is left to be done in the sick-room after the removal of the body?

VOCABULARY.

Abdomen. That portion of the trunk situated between the diaphragm and the pelvis.

Abductor. A muscle drawing away from the median line.

Abnormal. Unnatural.

Abortion. Premature expulsion of a fœtus.

Abscess. A circumscribed cavity containing pus.

Acetated. Combined with acetic acid.

Acids. Chemical agents which redden vegetable blues. They are usually sour in taste.

Acronarcotic. Combining irritant and narcotic action.

Actual Cautery. A hot iron used in cauterization.

Acute. Sharp. A disease having rapid progress and short duration is said to be acute.

Acupressure. The compression of blood-vessels by needles.

Adductor. A muscle drawing toward the median line.

Adhesion. Sticking together of unlike particles.

Adipose. Fatty.

Ætiology. The science of the causes of disease.

Afferent. Conveying toward the center.

Albuminoid. Resembling albumen.

Albuminuria. The presence of albumen in the urine.

Algid. Cold.

Alkalies. Substances which have the power of restoring the blues reddened by acids.

Alimentary Canal. The tube extending from the mouth to the anus.

Alterative. A medicine producing gradual change.

Alveoli. The sockets for the teeth.

Amenorrhœa. Absence of the menstrual discharge.

Amnion. The sac inclosing the fœtus.

Amorphous. Without regular shape.

Amylaceous. Starchy.

Anæmia. A lack of red corpuscles in the blood.

Anæsthesia. Loss of sensibility.

Anasarca. An accumulation of serum in the cellular tissue.

Anastomosis. Communication of vessels.

Anatomy. The science that describes the form and position of parts.

Aneurism. A dilatation or rupture of an artery.

Aneurismal Varix. Swelling of a vein from entrance of arterial blood.

Anhydrous. Containing no water.

Ankylosis. Abnormal rigidity of a joint.

Anodyne. Medicine to allay pain.

Antacid. A remedy against acidity.

Anterior. In front.

Anthelmintic. A remedy against worms.

Antidote. A remedy against poison.

Antipyretic. Opposed to fever.

Antiseptic. Preventing putrefaction.

Anus. The opening at the inferior extremity of the rectum.

Aorta. The great artery of the body.

Aphasia. Loss of the power of speech.

Aphonia. Loss of voice.

Aphthæ. Small white ulcers of the mucous membrane.

Apnœa. Absence of breath.

Apophysis. A bony process.

Apoplexy. Hæmorrhage into the substance of an organ.

Apyrexia. Absence of fever.

Aqueous. Watery.

Areola. 1. A circle around the nipple. 2. An inflamed circle around an eruption.

Areolar Tissue. Cellular or connective tissue.

Articulation. The joining of bones.

Arthritis. Inflammation of a joint.

Artery. A vessel conveying blood from the heart.

Ascaris. A worm found in the intestines.

Ascites. A collection of serous fluid in the abdomen.

Asphyxia. *Without pulse.* Suspended animation.

Assimilation. The process by which bodies appropriate and transform other matters into their own substance.

Asthenia. *Want of strength.* Exhaustion.

Astragalus. The ankle-bone.

Astringent. Having the power of contracting organic tissues.

Ataxic. Irregular.

Atlas. The first cervical vertebra.

Atony. *Loss of tone.* Weakness.

Atrophy. Wasting away.

Auricles. The upper chambers of the heart.

Auscultation. The act of listening.

Automatic. Involuntary.

Autopsy. The examination of a body after death.

Axilla. The arm-pit.

Axis. 1. A right line passing through the center of a body. 2. The second cervical vertebra.

Bacteria. Microscopic organisms found in decomposing matter, and believed to be the cause of many diseases.

Ballottement. The falling back of the fœtus in utero when displaced by the examining finger.

Base. *A foundation.* 1. That which serves as a support. 2. A chemical substance which, uniting with an acid, will form a salt.

Basis. The principal ingredient of a compound prescription.

Benign. Of a mild character.

Bile. The secretion of the liver.

Biliary. Relating to bile.

Biology. The science of life.

Bistoury. A small, narrow-bladed knife used in surgery.

Bolus. A large pill.

Borborygmus. A rumbling in the intestines.

Bougie. An instrument, shaped like a candle, for dilating mucous canals.

Brachial. Pertaining to the arm.

Bronchi. The branches from the trachea leading into the lungs.

Bulimia. Abnormal appetite.

Bursa. A small sac containing fluid, found near the joints.

Cachexia. A generally bad condition of the body.

Cadaver. A dead body.

Cæcum. The beginning of the large intestine.

Cæsarean Section. The operation of removing a child from the uterus by incision through the abdomen.

Calcareous. Having the nature of lime.

Calculus. A stone.

Callus. The new material thrown out to unite the fracture of a bone.

Capillary. Hairlike in size.

Capsule. 1. A membranous expansion inclosing a part. 2. A gelatinous envelope in which medicines may be given.

Carcinoma. Cancer.

Cardiac. Pertaining to the heart.

Caries. Ulceration of bone.

Carminative. A remedy which allays pain by causing the expulsion of flatus from the alimentary canal.

Cartilage. A smooth, elastic tissue, somewhat softer than bone.

Catalepsy. A disease in which there is sudden suspension of the senses and of the will, the body remaining in whatever position it is placed.

Catamenia. The menstrual discharge.

Cataplasm. A poultice.

Cataract. An opacity of the crystalline lens.

Catarrh. Increased secretion from a mucous membrane.

Cathartic. A medicine producing free discharges from the bowels.

Catheter. A tubular instrument for introduction into the canals of the body.

Caustic. A substance which burns living tissues.

Cellular. Composed of cells.

Cellulitis. Inflammation of the cellular or connective tissue.

Cephalalgia. Headache.

Cephalic. Relating to the head.

Cerebellum. The lesser brain.

Cerebrum. The brain.

Cervical. Pertaining to the neck.

Cervix. Neck.

Cholagogue. A medicine increasing the flow of bile.

Chorea. St. Vitus's dance.

Chorion. The outer envelope of the ovum.

Chronic. Of long duration.

Chyle. The milky fluid made from chyme.

Chyluria. Milky urine.

Chyme. The mass into which food is changed by the stomach.

Cicatrix. A scar.

Cilia. Hair-like projections.

Circumscribed. Distinctly limited.

Clinical. At the bedside.

Clonic. Convulsions with alternate relaxation.

Clyster. An enema.

Coagulation. Curdling of a fluid.

Coaptation. *Fitting together.* The act of adapting to each other the ends of a broken bone.

Cœliac. Relating to the abdominal cavity.

Cohesion. The force which holds like particles together.

Collapse. Complete prostration of the vital powers.

Colliquative. Applied to exhausting discharges.

Colloid. Jelly-like.

Collyrium. Eye-water.

Colostrum. The first milk secreted after confinement.

Colotomy. The operation of opening the colon.

Coma. A state of profound insensibility.

Comminuted. Broken in small pieces.

Complication. The existence of two or more disorders at the same time.

Compound Fracture. One which communicates with the surface by a wound.

Confluent. Running together.

Congenital. Existing from birth.

Congestion. The accumulation of blood in any organ.

Conjunctiva. The membrane covering the globe of the eye and lining the eyelid.

Connective Tissue. A lace-work of fibrous threads which extends through all the organs of the body, binding their elements together.

Contagion. The communication of disease by contact.

Continuity. An uninterrupted connection of parts.

Contra-indication. An indication against.

Contusion. A bruise.

Convalescence. The period of recovery from disease.

Convulsions. Involuntary contractions of the muscles.

Copperas. Sulphate of iron.

Corium. The true skin.

Corpuscle. A minute body.

Corrective. Mitigating the action of.

Corrosive. Eating into.

Cortex. Bark.

Coryza. Inflammation of the mucous membrane of the nose.

Costal. Relating to the ribs.

Counter-irritation. Irritation excited in one part of the body to relieve another.

Cranial. Pertaining to the skull or cranium.

Crepitation. 1. The sound of air passing through fluid. 2. The grating made by rubbing together the ends of a broken bone.

Crepitus. Crepitation. Chiefly used in the latter sense.

Crisis. The turning-point in a disease.

Crucial. Having the shape of a cross.

Cumulative. Increasing by successive additions.

Cutaneous. Belonging to the skin.

Cuticle. The external layer of the skin.

Cyanosed. Blue.

Cyst. A closed sac.

Cystitis. Inflammation of the bladder.

Decoction. 1. The operation of boiling certain ingredients in a fluid. 2. The result of such boiling.

Decomposition. Separation of a body into its component parts.

Decubitus. Lying down.

Defecation. The discharge of fæcal matter.

Defervescence. The decline of fever.

Deglutition. Swallowing.

Dejection. The act of emptying the bowel.

Delirium. Wandering of the mind.

Dementia. Feebleness of mind.

Demulcent. Soothing.

Deodorant. Destroying odors.

Depletion. Emptying.

Derma. The skin.

Dermatology. The science relating to the skin.

Desquamation. Scaling off of the skin.

Desiccation. Drying.

Detergent. A cleansing remedy.
Determination. Strong and rapid flow of fluid to any part.
Diachylon. Lead plaster.
Diagnosis. Distinguishing one disease from another.
Diaphoretic. A medicine which excites perspiration.
Diaphragm. The large muscle separating the chest from the abdomen.
Diastole. The dilatation of the heart and arteries on entrance of the blood.
Diathesis. A peculiar disposition or condition of the system.
Dicrotic. Rebounding.
Dietetics. A branch of medicine comprising rules of diet.
Digestion. Dissolving. The change which food undergoes in the alimentary canal.
Digital. Pertaining to the fingers.
Dilatation. Expansion in all directions.
Diluents. Medicines which increase fluidity.
Director. A grooved instrument for guiding a knife.
Discrete. Distinct.
Disinfectant. An agent which destroys septic germs.
Dislocation. Displacement.
Distal. Farthest from the heart.
Diuresis. An increased excretion of urine.
Dorsal. Pertaining to the back.
Douche. A column or shower of fluid.
Drastic. Strongly active.
Duct. Any tube or canal.
Duodenum. The first part of the intestinal canal.
Dysmenorrhœa. Difficult or painful menstruation.
Dyspepsia. Difficult digestion.
Dysphagia. Difficulty in swallowing.
Dyspnœa. Difficulty in breathing.
Dysuria. Difficult and painful passage of urine.

Ecchymosis. An extravasation of blood into connective tissue.
Eclampsia. Convulsions.
Eczema. A vesicular eruption.
Efferent. Taking away from the center.
Effervescence. The escape of gas through liquid, independently of heat.

Effete. Worn out.

Effusion. A pouring out.

Electrolysis. Decomposition by electricity.

Electuary. A soft confection.

Elimination. The act of expelling.

Embolus. A plug obstructing a blood-vessel.

Embrocation. A liniment.

Embryo. The fecundated germ in its early stages of development.

Emesis. The act of vomiting.

Emetic. Producing emesis.

Emmenagogue. A medicine promoting the menstrual discharge.

Emollients. Substances which relax and soften the tissues.

Emphysema. Air escaped into the connective tissue.

Empyema. Pus in the pleural cavity.

Emulsion. A mixture of oil and water.

Encysted. Inclosed in a sac.

Endemic. Peculiar to a locality.

Endermic. A method of treatment by placing remedies in contact with the skin after the removal of the cuticle.

Endocardium. The lining membrane of the heart.

Endometritis. Inflammation of the mucous membrane of the uterus.

Enema. A fluid preparation for injection into the rectum.

Enepidermic. A method of treatment consisting in the application of remedies to the skin.

Ensiform. *Sword shaped.*

Enteric. Intestinal.

Enuresis. Inability to hold the urine.

Epidemic. A disease attacking many people.

Epidermis. The scarf-skin or cuticle.

Epigastrium. The region near the stomach.

Epiphysis. A bony process not yet ossified to the main part.

Epispastics. Blistering agents.

Epistaxis. Hæmorrhage from the nose.

Epithelioma. A cancerous tumor.

Epithelium. The thin layer like the epidermis.

Eructation. Bringing up gas from the stomach.

Erythema. A superficial redness of the skin.

Escharotic. A substance which occasions sloughing.

Exacerbation. An increase in the symptoms of a disorder.

Exanthemata. The eruptive fevers.
Excoriation. An abrasion of the skin.
Excretion. The throwing off of waste matter.
Expectant. Treatment by leaving disease to nature.
Expectorant. A medicine facilitating the expulsion of sputa.
Extension. Pulling out.
Extensor. A muscle which extends a part.
Extirpation. Complete removal.
Extravasation. The escape of the contents of vessels into the surrounding tissues.
Extra-uterine. Outside the uterus.
Exudation. Oozing through the pores of a membrane.

Fæces. Evacuations from the bowels.
Fasciæ. Fibrous membranes binding parts together.
Fauces. The throat.
Febrifuge. Driving away fever.
Febrile. Pertaining to fever.
Fenestra. *A window.* An opening.
Fermentation. A spontaneous chemical change.
Fissure. A crack.
Fistula. A narrow canal lined by false membrane.
Flatulence. Gas in the alimentary canal.
Flexor. A muscle which bends the parts upon which it acts.
Fluctuation. The undulation of fluid as felt by the hands.
Fœtus. The young of any animal in the uterus.
Follicle. A small secreting cavity.
Fomentation. The application of hot cloths.
Fontanelles. Spaces between the cranial bones in the young child.
Formication. A sensation as of ants creeping over the body.
Fracture. A solution of continuity in a bone.
Fumigation. Charging the air with gas or vapor.
Fugacious. Fleeting.
Function. The office or duty of an organ.
Funis. The umbilical cord.
Fundus. The base.
Furuncle. A boil.

Galactorrhœa. An excessive flow of milk.
Gall-stones. Biliary concretions.

Ganglion. 1. A mass of nerve matter. 2. A tumor in the course of a tendon.
Gangrene. The first stage of mortification.
Gastric. Pertaining to the stomach.
Genital. Pertaining to the function of reproduction.
Germ. The undeveloped rudiment of a new being.
Gestation. Pregnancy.
Gland. An organ having the function of secretion.
Globule. A little ball.
Globus hystericus. The sensation of a ball in the throat.
Gramme. A French unit of weight, equivalent to a little more than fifteen grains.
Granulations. Small red eminences forming on the surfaces of suppurating wounds.
Grumous. Clotted.

Hæmatemesis. Vomiting of blood.
Hæmaturia. Blood in the urine.
Hæmoptysis. Spitting of blood.
Hæmorrhage. The escape of blood from its vessels.
Hæmostatic. An agent to stop hæmorrhage.
Hemicrania. Pain in one side of the head.
Hemiplegia. Paralysis of the lateral half of the body.
Hepatic. Relating to the liver.
Hernia. The displacement and protrusion of a viscus from its natural cavity.
Histology. The minute anatomy of the tissues.
Hydragogue. A medicine causing watery evacuation.
Hydrated. Combined with water.
Hydropathy. Water-cure.
Hygiene. The preservation of health.
Hyperæmia. An excess of blood in the capillaries.
Hyperæsthesia. Excessive sensibility.
Hyperpyrexia. Very high fever.
Hypnotic. Sleep producing.
Hypochondrium. The region under the false ribs.
Hypodermic. Subcutaneous.
Hypogastrium. The lower part of the abdomen.

Idiopathic. Primary affection.

Idiosyncrasy. Peculiarity.

Impacted. Wedged in.

Imperforate. Without an opening.

Inanition. Exhaustion for want of nourishment.

Incision. A cut.

Incompatible. Can not be employed together.

Incontinence. Inability to restrain.

Incubation. Hatching. The period between the reception of a poison and the appearance of the symptoms.

Indolent. Giving little or no pain.

Induration. Hardness.

Infection. The communication of disease.

Infiltration. The escape of fluids into connective tissue.

Inflammation. A series of changes characterized by heat, redness, swelling, and pain.

Infusion. 1. The process of steeping a substance in fluid. 2. The resulting liquor.

Ingesta. Articles introduced into the alimentary canal.

Inguinal. Pertaining to the groin.

Injection. Throwing a fluid into the body.

Inoculation. Injection of a virus into the body.

Inosculation. Anastomosis.

Insertion. The attachment of one part to another. Of a muscle, the movable point toward which its force is directed.

Insomnia. Sleeplessness.

Inspiration. Drawing in the breath.

Iusufflation. The act of blowing into a cavity of the body.

Integument. A covering. The skin.

Intercostal. Between the ribs.

Intermittent. Ceasing at intervals.

Intracapsular. Within a capsule.

Intravenous. Within a vein.

Intussusception. The slipping of one part of the intestine into another.

Inunction. The rubbing in of an ointment.

Involution. The gradual return of parts to a normal size and condition.

Irreducible. Not to be replaced.

Irrigation. Regular and continuous washing of a part.

Irritation. Excess of vital movement, usually manifested by increase of circulation and sensibility.

Isomeric. Having the same composition but different properties
Isothermal. Having the same temperature.
Issue. A flow of pus.

Jaundice. Yellowness resulting from some obstruction in the course of the bile.
Jugular. Relating to the throat.

Koumyss. Fermented milk.

Labial. Relating to the lips.
Laceration. A breach made by tearing.
Lachrymal. Pertaining to tears.
Lactation. Suckling.
Lacteals. Vessels conveying chyle.
Laparotomy. Opening the abdomen.
Latent. Concealed.
Lateral. On the side.
Laxative. A gently evacuating medicine.
Lesion. Injury or disorder.
Lethargy. Stupor.
Leucorrhœa. A white vaginal discharge.
Ligament. A fibrous band uniting bones.
Ligation. Tying.
Ligature. The thread used for tying a vessel.
Liquor Amnii. The fluid in which the fœtus floats.
Lithic. Relating to stone.
Litmus. A vegetable blue pigment. Acids turn it red.
Litre. A French measure equivalent to about two pints.
Lobe. A division of an organ.
Local. Limited to one place.
Lochia. The discharge of blood and serum following childbirth.
Loins. The lumbar region.
Luxation. A dislocation.
Lymph. 1. The fluid contained in the lymphatic vessels. 2. The fluid poured out in adhesive inflammation.

Maceration. Making soft by steeping.
Malaise. Indisposition.
Malaxation. Kneading.
Malformation. Irregularity in structure.

Malignant. Serious in character.

Malingery. Feigning disease.

Malnutrition. Poor nourishment.

Mammary. Relating to the breasts.

Manipulation. Handling.

Marasmus. Wasting away.

Massage. Malaxation of the muscles.

Mastication. Chewing.

Matrix. The place where anything is formed.

Meatus. The opening of a canal.

Meconium. The matter contained in the bowels before birth.

Median Line. An imaginary line dividing the body longitudinally into two equal parts.

Medication. Treatment by medicine.

Medulla. Marrow.

Medulla Oblongata. The expansion of the spinal cord at the base of the brain.

Melæna. 1. Tar-like evacuations. 2. Hæmorrhage from the intestines.

Meningitis. Inflammation of the membranes of the brain.

Menorrhagia. Excessive menstruation.

Menstrual. Monthly.

Mesentery. A large fold of peritonæum holding the small intestines in position.

Metastasis. A change in the seat of a disease.

Metritis. Inflammation of the womb.

Miasm. A poisonous emanation.

Micturition. The act of passing water.

Minim. The sixtieth part of a fluid drachm.

Miscarriage. Premature expulsion of a fœtus.

Mole. 1. A fleshy growth in the uterus. 2. A rounded fatty nævus.

Morbid. Diseased.

Morbific. Causing disease.

Moribund. About to die.

Mortification. Loss of life in a part.

Motor. Producing motion.

Moxa. An inflammable cone used as a powerful counter-irritant.

Mucus. A viscid fluid secreted by mucous membranes.

Multipara. A woman who has borne several children.

Myopia. Short-sightedness.

Nævus. A birth-mark.
Narcotic. Stupefying.
Narcosis. The condition produced by narcotic substances.
Nasal. Pertaining to the nose.
Nares. The nostrils.
Nates. The buttocks.
Nausea. Sickness at the stomach.
Necrosis. Death of a bone.
Nephritic. Pertaining to the kidneys.
Nervine. Acting on the nervous system.
Neuralgia. Non-inflammatory pain in a nerve.
Neurilemma. The sheath investing the nerve fibers.
Neuroses. Diseases of the nervous system.
Neurosthenia. Nervous irritation.
Neutral. Having neither basic nor acid properties.
Neutralize. To counteract.
Normal. Natural.
Nosology. Classification of disease.
Nostalgia. Home-sickness.
Nucleus. A kernel.
Nutrition. Nourishing.

Obesity. Excessive fatness.
Objective. External.
Oblique. Slanting.
Obstetrics. Midwifery.
Occipital. Relating to the back of the head.
Occlusion. Shutting up.
Ocular. Pertaining to the eye.
Odontalgia. Toothache.
Œdema. Swelling from the infiltration of serum into the areolar tissue.
Officinal. Authorized by the pharmacopœia.
Oleaginous. Oily.
Olfactory. Relating to the sense of smell.
Omentum. A layer of peritonæum hanging loosely in the abdomen.
Onychia. An abscess at the side of the finger-nail.
Ophthalmia. Inflammation of the eye.
Opiate. A medicine containing some form of opium.
Optic. Pertaining to vision.

Oral. Relating to the mouth.
Orbit. The socket containing the eye.
Organ. Part of a living being exercising some special function.
Origin (of a muscle). Its fixed or central attachment.
Orthopædic. Correcting deformity.
Orthopnœa. Inability to breathe lying down.
Os. 1. *Mouth.* 2. *Bone.*
Osmosis. The passage of fluid through a porous solid.
Osseous. Bony.
Ossification. Conversion into bone.
Osteitis. Inflammation of bone.
Otitis. Inflammation of the ear.
Otorrhagia. Hæmorrhage from the ear.
Ovarian. Pertaining to an ovary.
Ovariotomy. Removal of the ovary.
Ovulation. The formation of ovules in and their discharge from the ovary.
Ovum. The embryo and its membranes.
Oxidation. Combining with oxygen.
Ozœna. An offensive discharge from the nose.
Ozone. A peculiar modification of oxygen.

Palate. The roof of the mouth.
Palliative. Alleviating.
Palmar. Pertaining to the palm of the hand.
Palpation. 1. The sense of touch. 2. Exploring diseases by pressure with the hand.
Panacea. A universal remedy.
Papilla. 1. The nipple. 2. A small eminence on the surface.
Paracentesis. The operation of tapping.
Paralysis. Loss of voluntary motion or sensation.
Paraplegia. Paralysis of the lower half of the body.
Parasiticide. An agent that kills parasites.
Parenchyma. The texture of organs.
Parietal. Pertaining to the walls.
Paroxysm. A periodical attack or exacerbation of a disorder.
Parturition. The act of bringing forth.
Patella. The knee-pan.
Pathology. The physiology of disease.
Patulous. Wide open.

Pectoral. Pertaining to the chest.

Pediculus. A louse.

Peptone. A combination between the solvent fluid in the stomach and the albuminous constituents of the food.

Percussion. Striking on a body to elicit sounds.

Pericardium. The serous membrane enclosing the heart.

Perinæum. The triangular space between the tuberosities of the ischium, the anus and the genitals.

Periosteum. The membrane covering the bones.

Peristaltic. Undulating or worm-like. Applied particularly to the motions of the alimentary canal.

Peritonæum. A serous membrane lining the abdominal cavity and covering its organs.

Pessary. An instrument to support the uterus.

Petechiæ. Spots on the skin occurring in the course of severe fevers.

Pharmaceutics. The science of preparing medicines.

Pharmacopœia. A book giving directions for making medicines.

Phenomenon. An appearance.

Phlebitis. Inflammation of a vein.

Phlebotomy. Opening a vein.

Phrenic. Relating to the diaphragm.

Phthisis. Tubercular disease of the lungs.

Physical. Pertaining to material things.

Physiology. The science of life.

Pipette. A small glass tube.

Placenta. A vascular body by which the fœtus is connected with the uterus.

Placenta Prævia. The attachment of the placenta over the mouth of the uterus.

Plasma. The colorless fluid of the blood.

Plastic. Formative.

Plethora. An excess of blood.

Pleura. The serous membrane covering the lungs.

Pleuritis. Inflammation of the pleura.

Pleurodynia. Pain in the muscles of the chest.

Plexus. A network of blood-vessels or nerves.

Pneumogastric. Pertaining to the lungs and stomach.

Podalic. Relating to the foot.

Polypus. A kind of tumor occurring in mucous membranes.

Post mortem. After death.

Posterior. Behind.
Præcordial. About the heart.
Presbyopia. Far-sightedness.
Primipara. A woman who bears her first child.
Probe. An exploring instrument.
Process. An eminence of bone.
Prognosis. A prediction of what course a disease will take.
Prolapse. A falling down.
Prophylaxis. Prevention.
Proximal. Nearest the heart.
Psychical. Pertaining to the mind.
Ptyalism. Salivation.
Puerperal. Relating to parturition.
Pulmonary. Relating to the lungs.
Pulsation. Beating of the heart and arteries.
Purgative. Cathartic.
Purulent. Having the character of pus.
Pus. A secretion resulting from inflammation.
Pustule. A minute abscess.
Pyæmia. Contamination of the blood by pus.
Pyrexia. Fever.
Pyrosis. Water-brash.

Quarantine. Enforced isolation as a preventive of contagion.
Quartan. Recurring every fourth day.
Quickening. The first movements of the fœtus felt in the uterus.

Râles. Sounds in the air-passages produced by air passing through fluid.
Rectification. The process of refining liquids.
Reduction. The restoring of displaced parts.
Recuperative. Tending to recovery.
Recurrent. 1. Running back. 2. Tending to recur.
Refrigerant. Producing cold.
Regimen. Regulation of diet.
Regurgitation. Throwing back a portion of the contents.
Relapse. A return of disease.
Relaxation. Remitting tension. Opposed to contraction.
Remission. Abatement of symptoms.
Renal. Relating to the kidneys.

Resection. Removing a portion of bone.
Resolution. Gradual disappearance of a disease.
Retention. Holding back a substance that should be expelled.
Retroversion. Turning backward.
Revulsion. Turning the principle of a disease from the part in which it seems to be seated.
Rhythm. Measured movement.
Rigor. A chill.
Rigor mortis. A stiffening of the muscles occurring after death.
Rubefacient. Making red.

Sac. A bag or pouch.
Saccharine. Containing sugar.
Salivation. Excessive secretion of saliva.
Salt. The compound of an acid and a base.
Sanatory. Curative.
Sarcolemma. The sheath inclosing muscular fibers.
Sarcoma. A fleshy excrescence.
Saturation. The union of one substance with another until it can take no more.
Scalpel. A sharp knife for dividing soft parts.
Scarification. Making several small incisions.
Sciatic. (*A contraction of ischiatic.*) Relating to the hip.
Scirrhus. A hard cancerous tumor.
Scybala. Hard lumps of fæcal matter.
Sebaceous. *Resembling suet.*
Secondary. Acting subordinately to another.
Secretion. The process by which substances are separated from the blood.
Secundines. The placenta and the membranes remaining in the uterus after the birth of the child.
Sedative. Quieting.
Sediment. The deposit from a liquid.
Semeiology. The knowledge of symptoms.
Sensorium. The center of perceptions.
Sepsis. Putrefaction.
Septic. Producing putrefaction.
Septicæmia. Blood-poisoning by putrid infection.
Sequelæ. Morbid phenomena resulting from disease.
Serum. The watery portion of animal fluids.

Shock. Sudden depression of vital powers.

Show. A vaginal discharge occurring just before labor.

Sialagogue. A substance producing an increased flow of saliva.

Sinapism. A mustard plaster.

Singultus. Hiccough.

Sinus. Any cavity the interior of which is larger than the opening.

Slough. A dead portion separating from the living.

Solar. Having rays like the sun.

Solution. A chemical union between a fluid and a solid.

Solvent. A substance in which another is dissolved.

Sopor. Profound sleep.

Sordes. An accumulation of the secretions of the mouth upon the teeth.

Spasm. An involuntary muscular contraction.

Specific. Special.

Speculum. An instrument for dilating cavities.

Sphincter. A circular muscle constricting a natural opening.

Spongiopiline. A fabric composed of sponge and wool felted together and coated with caoutchouc.

Spontaneous. Voluntary.

Sporadic. Occurring in single or scattered cases.

Sprain. A violent stretching of the soft parts surrounding a joint.

Sputum. Matter spit out.

Stercoraceous. Fæcal.

Sternutatory. Provoking sneezing.

Stertor. A deep snoring sound accompanying inspiration.

Stethoscope. A tube for conveying sounds from the chest to the ear.

Stomatitis. Inflammation of the mouth.

Strabismus. Squinting.

Strangury. Slow and painful passage of urine.

Stricture. Contraction of a duct or tube.

Stupe. The cloth used in fomentations.

Stupor. Profound unconsciousness.

Styptic. Astringent.

Subcutaneous. Under the skin.

Subjective. Originating within one's self.

Sublimation. The process of volatilizing and condensing.

Subsultus. Muscular twitching.

Sudamina. Small vesicles associated with profuse sweating.

Sudoriferous. Sweat-bearing.

Suffusion. Pouring out of a fluid.

Supernatant. Floating on the surface.

Suppository. Medicine in a solid form intended for introduction into the rectum.

Suppression. The stoppage of a secretion or discharge.

Suppuration. The formation of pus.

Suspensory. That which holds up.

Sutures. 1. The articulations of the bones of the skull. 2. Stitches for holding together the edges of a wound.

Symphyses. Articulations of the pelvis, one between the pubic bones, the other between the ilia and the sacrum.

Symptom. An appearance in disease.

Synchondrosis. Union by cartilage.

Syncope. Fainting.

Synovia. A viscid liquid secreted about the joints.

Syphilis. An infectious venereal disease.

Systemic. Pertaining to the body generally.

Systole. The contraction of the heart and arteries.

Tactile. Relating to the sense of touch.

Tænia. A kind of intestinal worm.

Talipes. Club-foot.

Tampon. A plug.

Taxis. Pressure by the hand on a hernial tumor for the purpose of reducing it.

Tendon. A fibrous tissue attaching muscle to bone.

Tenesmus. Frequent, vain, and painful efforts to evacuate the bowel.

Tenotomy. Division of a tendon.

Tension. State of being stretched.

Tent. A cylinder for dilating parts.

Tertian. Occurring every third day.

Tetanus. A disease characterized by continuous muscular spasm.

Therapeutics. The treatment of disease.

Thermal. Relating to heat.

Thermometer. An instrument for measuring the intensity of heat.

Thoracic. Relating to the chest.

Throbbing. Palpitation.

Thrombosis. The obstruction of a blood-vessel by a clot.

Tidal Air. The air expired and inspired in ordinary respiration.

Tincture. A solution in spirit.

Tissue. The peculiar structure of a part.

Tolerance. The power of bearing medicine.

Tone. A proper state of tension or firmness.

Tonic. A medicine increasing the strength.

Topical. Local.

Tormina. Twisting pains in the bowels.

Torsion. Twisting.

Tourniquet. An instrument for making pressure upon an artery.

Toxic. Poisonous.

Tracheotomy. Opening the trachea.

Transfusion. Process of transferring blood from one animal into the veins of another.

Transpiration. Perspiration.

Transudation. Passage of a fluid through a porous tissue.

Traumatic. Resulting from a wound.

Trismus. Lockjaw.

Trituration. Reducing to a fine powder.

Trocar. An instrument for evacuating fluids from cavities.

Trochanters. Two processes at the upper extremity of the thigh bone.

Troche. A lozenge.

Tubal. Pertaining to a tube, especially the Fallopian.

Tubercle. A deposit of degenerate matter in the substance of organs.

Tumefaction. Swelling.

Tumor. A morbid enlargement.

Tympanites. Distention of the abdomen by gas.

Type. Peculiar form of disease.

Ulcer. A solution of continuity of the soft parts attended with secretion of pus.

Umbilicus. The navel.

Unguent. An ointment.

Uræmia. Poisoning by urea in the blood.

Urea. The nitrogenous constituent of the urine.

Urinometer. An instrument for testing the specific gravity of urine.

Ustion. Burning.

Uterine. Relating to the uterus or womb.

Utero-gestation. Pregnancy.

Vaccination. Inoculation with the virus of cow-pox.
Valetudinarian. One in delicate health.
Varicose. Affected with varix.
Varix. Enlarged or twisted condition of a vein.
Vascular. Full of vessels.
Vaso-motor. Causing motion of vessels.
Vein. A vessel carrying blood toward the heart.
Venereal. Pertaining to sexual intercourse.
Venesection. Cutting a vein.
Ventilation. Supplying fresh air.
Ventricles. The lower cavities of the heart.
Vermifuge. Driving out worms.
Vernix Caseosa. A fatty deposit found on the fœtus or new-born child.
Version. Turning.
Vertebra. One of the bones of the spinal column.
Vertigo. Dizziness.
Vesicant. A blistering agent.
Vesicle. A very small blister.
Vessel. A tube or canal containing fluid.
Viable. Sufficiently developed to live.
Vicarious. Taking the place of another.
Villi. Little elevations of the mucous membrane containing vessels.
Virus. A morbid poison.
Viscera. The internal organs.
Viscus. Singular of viscera.
Vital. Pertaining to life.
Vivisection. The dissection of a live animal.
Volatile. Disposed to evaporate.
Vulva. The external genitals in the female.

Whitlow. An inflammation about the ends of the fingers.
Wisdom Teeth. The last of the true molars.
Wound. A solution of continuity in the soft parts.

Xanthosis. Yellow discoloration.

Zymotic. Resulting from fermentation.

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